



Harvesting Peace: Permaculture as Peacebuilding

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By

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## DEDICATION

This dissertation is dedicated to my mother, Blanca Romero with whom it has been a constant joy to share my life. Without her, I would have never known how to dream big and never give up. Upon dedicating this dissertation to my mother, I also dedicate it to all of the persons in her life that responded to a moment of favor destined for her and therefore also blessed me many years later as part of her journey. Although I do not know you, this dissertation is dedicated to: the man on the park bench that told a little girl to go to the newspaper office to apply for a scholarship when he saw her crying because she couldn't go to school; to the generous lawyer to help a young woman get her immigration paperwork completed without asking for money upfront and upon learning that she didn't have the money to pay him when the papers came through cancelled the bill; to the taxi driver Benjamin who drove a young woman from Philadelphia to Lancaster and only asked for a cup of coffee as payment for the hour's journey; to the countless others along the way — thank you. This dissertation is dedicated to all of those people on whose shoulders I stand.

Additionally, I dedicate this dissertation to my two grandmothers-- Maria Luisa and Ester. Abuelita Maria Luisa, dearest grandmother each of these written words are for you. It is my hope that each keystroke that follows serves as a point of light for all women who yearn for education. Mama Te, thank you for showing me your calm strength and sharing your love. I hope you will be proud.

*My heart praises the Lord; my soul is glad because God my Savior, for he has remembered me, his lowly servant! From now on all people will call me happy, because of the great things the Mighty God has done for me – Luke 1:46-49*

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## TABLE OF CONTENTS

	Page
ABSTRACT	ix
Chapter 1: Introduction	1
Chapter 2: Literature Review	6
Chapter 3: Research Methods	45
Chapter 4: Does Permaculture Impact Multiple-Levels of Practitioners Lives?	60
Chapter 5: What Are the Challenges in Implementing Permaculture?	96
Chapter 6: How Does the Postconflict Context Impact the Practice of Permaculture?	116
Chapter 7: Emergent Interview Themes	133
Chapter 8: What I Learned from the Interviews	141
Chapter 9: Permaculture as Peacebuilding	160
Chapter 10: Permaculture's Contributions to the Field of Conflict Analysis and Resolution	171
Chapter 11: Discussion	187

## LIST OF TABLES

Table	Page
<b>Table 1.</b> Coding Instances of Life Domains.....	61

## LIST OF FIGURES

Figure	Page
<b>Figure 1.</b> Holmgren’s Permaculture Flower (from <i>Permaculture Principles &amp; Pathways Beyond Sustainability</i> ; copyright 2002 by Holmgren Design Services and reprinted with permission of author.....	21
<b>Figure 2.</b> Holmgren’s Zone and Sector Analysis of Permaculture (from <i>Permaculture Principles &amp; Pathways Beyond Sustainability</i> ; copyright 2002 by Holmgren Design Services and reprinted with permission of author.....	184
<b>Figure 3.</b> Interview data coded to environmental conditions organized by prominent themes.....	209
<b>Figure 4.</b> Interview data coded to living conditions organized by prominent themes .....	211
<b>Figure 5.</b> Interview data coded to health organized by prominent themes .....	212
<b>Figure 6.</b> Interview data coded to permaculture personal impact organized by prominent themes.....	213
<b>Figure 7.</b> Interview data coded by permaculture impact on community organized by prominent themes.....	214
<b>Figure 8.</b> Interview coded to food security organized by prominent themes.....	215
<b>Figure 9.</b> Interview data coded to permaculture improvement organized by prominent themes.....	216
<b>Figure 10.</b> Network view of co-occurrence between seven life domains. Non co-occurring quotes have been removed from this view. To view the complete network, please see Appendix Ib.....	217
<b>Figure 11.</b> Network view of all interview quotes coded to seven life domains. This network shows the overall map of the quotes coded to each life domain and the co-occurrence between domains. See Appendix Ia for a view of network with non co-occurring quotes removed.....	218
<b>Figure 12.</b> Code map of Oscar’s interview .....	219
<b>Figure 13.</b> Code map of Tomas’ interview .....	220
<b>Figure 14.</b> Code map of Miguel’s interview .....	221
<b>Figure 15.</b> Code map of Elesseo’s interview .....	222
<b>Figure 16.</b> Code map of Alejandro’s interview .....	223
<b>Figure 17.</b> Code map of Angelica’s interview .....	224
<b>Figure 18.</b> Code map of Isabel’s interview .....	225



<b>Figure 19.</b>	Code map of Paco’s interview.....	226
<b>Figure 20.</b>	Code map of Karen’s interview.....	227
<b>Figure 21.</b>	Code map of Carmen’s interview.....	228
<b>Figure 22.</b>	Code map of Fermin’s interview.....	229
<b>Figure 23.</b>	Code map of Elizabeth’s interview.....	230
<b>Figure 24.</b>	Code map of Reina’s interview.....	231
<b>Figure 25.</b>	Code map of Noemi’s interview.....	232
<b>Figure 26.</b>	Code map of Gertudis’ interview.....	233
<b>Figure 27.</b>	Code map of Valentin’ interview.....	234
<b>Figure 28.</b>	Code map of Norma’s interview.....	235
<b>Figure 29.</b>	Code map of Regino’s interview.....	236
<b>Figure 30.</b>	Code map of Maria’s interview.....	237
<b>Figure 31.</b>	Code map of Thelma’s interview.....	238
<b>Figure 32.</b>	Code map of Miguel’s interview (MAOES).....	239
<b>Figure 33.</b>	Code map of Ricardo’s interview.....	240
<b>Figure 34.</b>	Interview data coded according to United Nations Environmental peacebuilding defintion.....	241

## ABSTRACT

### **HARVESTING PEACE: PERMACULTURE AS PEACEBUILDING**

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This dissertation is a qualitative case study of permaculture, a sustainable agriculture model based on bio-mimicry, in postconflict El Salvador. The case study is intended to be both descriptive and theory-building by providing empirically grounded insights into permaculture as a peacebuilding tool. A grounded theory investigation into permaculture practitioners' experiences revealed that permaculture is a holistic peacebuilding model that addresses war-induced environmental damage and postconflict structural violence. Permaculture impacts multiple dimensions of practitioners' lives, functions as sustainable livelihood education, contributes to the eco-localization of economies, and builds community between individuals while also creating a relationship of agency between natural environments and permaculture practitioners.

## Chapter 1: Introduction

*“All of the world’s problems can be solved in a garden.”*

*—Geoff Lawton, permaculture designer and educator*

Upon entering a doctoral program, students often think they know their dissertation research question on the first day they begin classes. So much time and effort goes into the process of getting into graduate school, only a person with a burning question about the world would sign up for the long journey to earn a doctorate. I entered my program at George Mason’s Institute for Conflict Analysis and Resolution brimming with research questions based on attribution theory. Much to my own surprise, as I progressed through the program I began exploring questions about the role of spirituality in conflict resolution. I was particularly interested in researching what conflict resolution practitioners could learn from women spiritual practitioners about women’s ritual and spiritual approaches to transformation and peacebuilding.

I began researching women who acknowledge that their personal spiritual transformation informs their approach to resolving social conflict. During this line of inquiry, I came across the work of Starhawk. Starhawk is perhaps best known as a pioneer in the revival of earth-based spirituality and Goddess religion. She is a well-known global justice activist and organizer who is deeply committed to bringing the techniques and

creative power of spirituality to political activism. Her writings combine ritual, magic, and spirituality into direct action. Starhawk considers her earth healing work as an expression of her spiritual principles. In her book *Webs of Power* (2002), Starhawk chronicles her participation in the global justice movement. She shares experiences gained from her participation in direct actions and from being a nonviolent activist trainer. In the book she writes about her personal practice of permaculture as part of her spiritual and activist discipline. She argues that permaculture—a regenerative ecological design system—is not limited to use only as an ecological design model but that it could also form the basis of new economic and security models built on principles of increased abundance. Her application of permaculture as a system for social change intrigued me, so I decided to attend the Earth Activist Training (EAT) where she conducts a permaculture design course infused with political organizing and strategies for social change. I was interested to see whether I also could find the connection between an ecological model and the challenge of social change.

Prior to attending the EAT, I read John Paul Lederach's book, *The Moral imagination: The art and soul of building peace* (2005). Lederach proposes that the field of conflict resolution needs to shift away from conceptualizing itself as a technical profession to conceptualizing itself as a vocation that is responsible for nurturing constructive social change by creating conditions where creativity can take root and transcend violence. He defines this creative space as "moral imagination." Moral imagination in peacebuilding requires the capacity to imagine and generate constructive responses and initiatives that are rooted in the day-to-day challenges of violence but that transcend and

break the destructive patterns and cycles of that violence. Immediately, I started filling the margins of Lederach's book (2005) with references to the same ideas, principles, and metaphors that appeared in Starhawk's writings. Both authors stressed the need for the creative act for social change and the centrality of relationships. They often used the same language to describe the processes of social change.

So when I packed my suitcase to attend the EAT training, I packed Lederach's book so that I could continue to take notes on the connections I was seeing. At first, a two-week intensive training seemed terribly intimidating to me—two weeks of no contact with the outside world, two weeks of working outdoors in the earth, and two weeks of living with complete strangers in very basic living conditions. Friends and co-workers joked that they weren't so sure I would survive the experience and many jokes were made about the need to send me off with a GPS device in case I got lost in the woods. The whole experience would be out of my comfort zone and yet I was excited.

While I was taking notes during the EAT lectures, I kept writing my acronym for the field of conflict analysis and resolution (CAR) in the margins every time I made a connection between the two fields. I felt as though the training was an applied practicum for the conflict analysis and resolution field. The training looked at systems of domination, economics, and sustainability. As I began to learn the foundational design ethics and principles of permaculture, I soon realized that what I was learning could be applied to the teaching and practice of conflict resolution. I saw connections between the skills needed to observe nature and the skills needed to design a conflict resolution intervention. Additionally, I was learning skills that are needed to satisfy basic human needs—

rain catchment, water filtering, rehabilitating damaged soil, increasing access to food, and natural home building. I was shocked to learn that permaculture has low-cost technological solutions to many of the world's basic problems of human need. The more I learned about permaculture over the two-week course, the stronger the connection between permaculture and conflict resolution became. Permaculture focuses on creating local solutions for local problems using local resources. It was during one of the training sessions that I first heard Geoff Lawton's famous quote, "All of the world's problems can be solved in a garden." Lawton's quote shifted my entire research focus and I began looking at the intersection between permaculture and conflict resolution.

I left the EAT course with a diverse set of skills and design techniques that empowered me to address issues of structural violence and environmental challenges in my everyday life and in my academic work. Permaculture has not been systematically researched from a conflict resolution or peacebuilding perspective and this dissertation aims to assess whether permaculture impacts multiple dimensions in practitioners' lives. In order to develop a theory of permaculture as peacebuilding, I decided to interview permaculture practitioners in the former civil war zone of El Salvador. The postconflict context of El Salvador was selected for two reasons: 1) permaculture is, in essence, an environmental rehabilitation tool and, although the impact of war on the environment has been well documented in El Salvador and across the globe, a theory of rehabilitation of the environment through a peacebuilding framework has not yet been developed; and 2) El Salvador has a high level of social marginalization, poverty, and environmental degradation. Rural subsistence farmers suffered the greatest damage to their livelihoods during

the war, and even though it has been 18 years since the official peace accords were signed, societal peace through equality has yet to be achieved. Dr. Salvador Menendez Leal, Adjunct Ombudsman for the Defense of Human Rights in El Salvador stated in the documentary *Return to El Salvador*, that

of the four objectives of the peace accord only one was actually accomplished ending of the armed conflict. Democratization, reconciliation, and a society based on the respect of human rights are yet to be achieved. So many of the conditions that caused the civil war between 1980 and 1992 are still present and have actually intensified during the time that has passed and they haven't been resolved . (Leal, 2009)

This dissertation will document the experiences of rural subsistence farmers living in former conflict zones whose livelihoods are impacted by remaining postconflict environmental damage. The field research was conducted in areas of El Salvador that had suffered significant damage through scorched-earth warfare.

A theory of environmental peacebuilding will be developed through a grounded theory analysis of in-depth interviews aimed at assessing the impact that permaculture has on practitioners' lives. The theory produced by this research will be helpful to the fields of both conflict resolution and permaculture by providing an integrated model of environmental restoration and community building.

## Chapter 2: Literature Review

This chapter begins with an overview of the impact of armed conflict on environmental resources and then moves on to survey the literatures of environmental scarcity, environmental peacebuilding, and postconflict peacebuilding. A brief introduction to permaculture is followed by a history of El Salvador and the chapter concludes with a history of permaculture in El Salvador.

Armed conflicts put tens of millions of people at risk for hunger and malnutrition each year. The United Nations Universal Declaration of Human Rights (1948) named food as an individual human right. However, the world continues to witness *food wars*, defined as wars in which hunger is used as a weapon or in which hunger is a direct result of destructive conflict due to chronic underproduction of food (Messer, Cohen, & D'Costa, 1998).

Violent conflict destroys the land, water, biological, and social resources required for food production. Conflict-driven hunger is created through food shortages and agricultural interruption. Hunger is often used as a weapon in war through sieges that destroy food stocks, livestock, and environmental assets in food-producing regions. Agricultural cycles are interrupted in war zones when annual crops are not sown, tended, or harvested,



and when perennial crops are often destroyed. Land mines prevent farming following warfare, further exacerbating situations where the food supply is already insecure.

Conflict-linked food shortages set the stage for years of food emergencies after the fighting has ceased, through a continued underproduction of food, which leads to poverty, malnutrition, and risk of renewed violence. Without essential food and infrastructures, a fragile peace can easily revert to conflict (Messer, Cohen, & D'Costa, 1998). Breaking the links between hunger and conflict must be a goal of agricultural, environmental, and economic development policy. Creating a hunger-free world will require the prevention of violent conflicts plus concentrated efforts to rebuild war-torn societies.

The United Nations Environment Programme (UNEP) released a report in 2009 entitled "From Conflict to peacebuilding: The role of the natural resources and the environment." The report explores how natural resources can contribute to the outbreak and sustaining of conflicts, discusses the impact of conflict on the environment, and details how the environment can ultimately contribute to postconflict peacebuilding. The environment is an often ignored but deeply impacted casualty of conflict. It is frequently used as a weapon and becomes a victim itself during conflict, as ecosystems are deliberately destroyed, wells poisoned, crops and forests burned, animals slaughtered, and soils become saturated with toxins. According to the UNEP, the majority of the environmental damage that occurs during conflict is collateral and related to the preparation and execution of wars and the resulting coping strategies of local populations. The UNEP report divides the impacts of conflict on the environment into three pathways (Matthew & Jensen, 2009, pp. 15–17):

**Direct impacts:** The physical destruction of ecosystems and wildlife, and the release of polluting and hazardous substances into the natural environment during conflict. This damage is most often the result of chemical and bomb damage but also includes the targeted destruction of water sources, forests, and human settlements.

**Indirect impacts:** Populations experiencing the effects of ongoing conflicts are forced to adopt coping strategies including migration or converting available natural resources into capital. Once the conflict has diminished, the resettlement of refugees can put intense pressure on natural resources. The indirect environmental impacts of wartime survival strategies and postconflict reconstruction can be more persistent and widespread than the direct impacts of war.

**Institutional impacts:** Public finances are often diverted for military purposes, leading to the decay and a lack of investment in water, waste, and energy services, in turn resulting in corresponding health and environmental contamination. The impacts of conflict on the environment are multi-dimensional and therefore, in peacebuilding, it is critical that the environmental drivers and impacts are managed, that tensions are defused, and that natural assets are used sustainably to support stability and development in the longer term. Indeed, there can be no durable peace if the natural resources that sustain livelihoods and ecosystems are damaged, degraded, or destroyed....Despite this, fewer than a quarter of peace nego-

tiations aiming to resolve conflicts linked to natural resources have addressed resource management...The environment and natural resources are often framed as issues to be addressed at a later stage.(Matthew & Jensen, 2009, p. 19).

The environmental peacebuilding literature traditionally has written about the environment as a tool for cooperation between parties and has not focused on generating environmental peacebuilding models that specifically address postconflict reconstruction and sustainable peace.

The environmental peacebuilding field developed as a response to the environmental scarcity literature that debated the relationship between natural resource scarcity and conflict. Thomas Homer-Dixon (1999) summarized the traditional orientations within the resource scarcity literature as being: 1) the position that the finite status of natural resources places natural limits on human population and consumption; 2) the stance that properly functioning economic institutions provide incentives for conservation and technological innovation; and finally, 3) the scarcity of resources is not a scarcity issue at all but rather a product of the maldistribution of resources and wealth (p. 28). Homer-Dixon created his own definition of environmental scarcity and proposes that his conceptualization of environmental scarcity goes beyond the traditional debates. According to Homer-Dixon, environmental scarcity is caused by the degradation and depletion of renewable resources, the increased demand for those resources, and/or their unequal distribution. He writes, “These three sources of scarcity often interact and reinforce each one another creating conditions for resource capture or ecological marginalization (p.

177). Resource capture takes place when elite members of a society shift natural resource distribution in their favor, while ecological marginalization occurs when unequal access to resources makes large groups of people dependent upon renewable resources for their livelihood. Homer-Dixon, and researchers following his empirical line of inquiry, are most interested in determining the link between environmental scarcity and the outbreak of violent conflict, but many questions remain about the conditions needed for scarcity to act as a trigger for violence.

It is often impossible to determine the relative weight or power of environmental scarcity as a cause of violence in specific cases. But this does not mean that environmental scarcity is always an unimportant cause and a large portion of the world's population is almost completely reliant on local croplands, water, and forest supplies for its daily existence. Skeptics usually underestimate the extent to which much of humankind still depend on its natural environment and therefore underestimate the social stress that environmental scarcity can cause. (Homer-Dixon, 1999, p. 179)

In 2002, Conca and Dabelko moved the orientation of looking at the environment as a trigger for violence to a new orientation of using the environment as a tool for cooperation to trigger broad forms of peace, thus laying the foundation for the environmental peacebuilding literature. They created two pathways by which environmental peacebuilding could occur: 1) it could alter the dynamics of mistrust and divergent interests by exploiting environmental problems as opportunities to create cooperative knowledge, shared gains, and cooperation behaviors, and 2) it could build transnational linkages

within civil society by creating a shared collective identity of interdependence and fostering new norms of environmental responsibility. According to Conca and Dabelko (2002), “environmental cooperation might be a useful instrument of international peace by removing multiple sources of insecurity, most of which are political, economic, and social rather than narrowly ecological (p. 13). Their focus for cooperation leans heavily toward institutional cooperation and mid-to-top level actors. This type of environmental peacebuilding does not engage in addressing actual ecological problems but rather approaches the environment as an external object to exploit as an opportunity for cooperation or to create a shared identity focusing exclusively on the human relationships without addressing the environmental problem itself.

The broader peacebuilding field contains frameworks that involve multiple dimensions and multiple levels of actors for the building of peace. Jeong (2005) described peacebuilding in postconflict societies as activities designed to enhance public security, generate economic recovery, facilitate social healing, and promote democratic institutions within short-term and long-term frameworks (pp. 12–13). Lederach (1997) described peacebuilding as a process made up of various interdependent roles, functions, and activities aimed at creating a sustainable transformation of restructured relationships (p. 71). He took a multilevel approach to peacebuilding by incorporating the participation of grassroots, middle-range, and top-level leadership in the process. The focus of each of these leadership types varies according to the impact their decisions could potentially have on a given population, but for peacebuilding to be successful, all levels of actors need to be engaged. Jeong’s (2005) work on peacebuilding in postconflict situations

recognizes the importance of including development activities in the peacebuilding efforts:

Development policies should be considered an integral part of a broader peace process, given that poverty and inequality sustained after internal conflict remain to undermine peace...[D]evelopment has to improve a social reality that is inhospitable to human material well being. (p. 123)

A gap has developed between peacebuilding that recognizes the need to address root causes of human vulnerability which can undermine peacebuilding and the traditional literature of environmental peacebuilding that focuses solely on human relationships. Concepts of environmental peacebuilding need to be broadened to include mechanisms to address the causes of environmental scarcity and postconflict environmental issues. The United Nations Environmental Programme report (2009) states:

The UN has not effectively integrated environment and natural resource considerations into its peacebuilding interventions...This is a mistaken approach, which fails to take into account the changing nature of threats to national and international security. Rather, integrating these [environmental] issues into peacebuilding should be considered a security imperative, as deferred action or poor choices made early on often establish unsustainable trajectories of recovery that may undermine long-term peace and stability....It is critical that they [environmental and natural resources] are not treated in isolation but instead form an integral part of the analysis and assessments that guide peacebuilding interventions. Indeed, it is only

through a cross-cutting approach that these issues can be tackled effectively as part of peacebuilding measures to address the factors that may trigger a relapse of violence or impeded the peace consolidation process. (p.19).

The UNEP has created a three-pronged approach to demonstrate how the environment and natural resources can constructively contribute to peacebuilding (Matthew & Jensen, 2009, pp. 19–22):

- 1 *Supporting economic recovery.* High-value natural resources, when properly governed and carefully managed, can stimulate a national economy. However, if the benefits are not shared or when environmental degradation occurs as a consequence of exploitation, there is a serious potential for conflict to resume.
- 2 *Developing sustainable livelihoods.* Durable peace fundamentally hinges on the development of sustainable livelihoods, the provision of basic services, and the recovery and sound management of the natural resource base. Environmental damage caused by conflicts, coping strategies, and chronic environmental problems that undermine livelihoods must be addressed from the outset. Minimizing vulnerability to natural hazards and climate change through the management of key natural resources and the introductions of appropriate technologies should also be addressed.

- 3 *Contributing to dialogue, cooperation, and confidence building.* The environment can be an effective platform or catalyst for enhancing dialogue, building confidence, exploring shared interests, and broadening cooperation between divided groups within and between states.

The UNEP's Expert Advisory Group on Environment, Conflict, and Peacebuilding recommends integrating natural resource and environmental issues in postconflict planning. The group stressed the importance of conducting systematic postconflict environmental assessments that identify environmental risks to human health, livelihoods, and security, and that postconflict planning projects should consider environmental sustainability prior to commencing (UNEP, 2009, p. 29). Assuming that a postconflict planning team decided to follow the recommendation, could they find particular models of environmental restoration and livelihood development that are inherently peace-oriented? The focus of this dissertation is to research permaculture, an environmental restoration and sustainable agriculture model, as a peacebuilding tool in postconflict contexts. This research will bridge the current gap in research by combining direct environmental restoration work with peacebuilding activities.

## **Introduction to Permaculture**

Permaculture was formulated by Australians Bill Mollison and David Holmgren in the 1970s and is a philosophy based on designing human habitats and sustainable food-production systems that mimic nature. Permaculture is an environmental development system that combines indigenous knowledge with appropriate technologies. It is a con-



sciously designed system which mimics the patterns and relationships found in nature and incorporates sustainable land-management practices. Permaculture is oriented around ethical and design principles that serve as a framework for the permaculture approach. The design principles are brief statements that are universal and the methods that express these principles will vary according to place and situation (Holmgren, 2007). Permaculture is based upon indigenous knowledge and therefore the approaches and techniques will vary according to local indigenous customs and resources. Since permaculture is rooted in local cultures and ecosystems, the approach may be appropriately applied in all regions of the globe.

There are three ethical principles in permaculture:

*Care of the Earth*—Working with nature to incorporate all aspects of local ecosystems, particularly soil systems.

*Care of People*—Promoting self-reliance, collaboration, and community responsibility.

*Fair Share*—Redistributing surpluses and setting limits to personal consumption.

Permaculture ethics ground permaculture practitioners, but it is the design principles that reflect the systems-ecology thinking that sets permaculture apart from other development techniques. Permaculture designer and trainer Patricia Allison (2009) created a permaculture principle teaching guide which combines the main permaculture principles with their design applications. The following is modified from Allison (2009):

### **Principle 1—Observe and interact**

The root of this principle is the willingness to begin designing a culture based on co-creating with nature. It is a willingness to work with nature to learn when to interfere, and when not to; learning what limitations and abundances exist, and when; and how to intermesh our social networks into an ecosystem to meet our needs. Observation practices include sitting in one spot, meditation, breathing awareness, journaling, nature walks, and learning how earth's cycles impact the land that one is designing.

### **Principle 2—Catch and store energy**

All energy comes from the sun, and since energy is lost with every transaction, we need to increase our interactions with the sun and plants to meet our energy needs. We want to catch all external energy that is moving through the site and convert it into energy we can use, store, or cycle through the system as needed. An example of this principle in nature is the way that ponds catch the energy of moving water and store it as potential kinetic energy, while absorbing sunlight and storing it as heat, which creates an additional microclimate.

### **Principle 3—Obtain a yield**

A system yield is the sum total of surplus energy produced by, stored, conserved, reused, or converted by the design. Permaculture designers create cultivated ecosystems that produce yields of food, shelter, fiber, and medicine. Every permaculture design must produce multiple and abundant yields. For example, a monocrop of corn may yield an

abundance of corn but if multiple crops are planted along with the corn, the combined polycrop will produce a higher yield from the same area of land.

**Principle 4—Apply self-regulation and accept feedback**

This principle is related to issues of scale by starting small, getting feedback, and re-designing. By making small changes and working with positive and negative feedback loops, the ability to conquer difficult challenges is increased. Rabbits provide an example of self-regulation and feedback. Rabbits feed themselves, fertilize the grass, and provide food for predators. However, if the rabbits start fertilizing brambles while escaping from predators, the system collapses because too many brambles outcompete with the grass and the rabbits lose their food source.

**Principle 5—Use and value renewable resources and services**

This principle values resources that are locally available and have the ability to regenerate in short periods of time, such using locally available wood for structures that will not rot before the replacement trees have matured.

**Principle 6—Produce no waste**

Every by-product from one element of a design must be productively used in another aspect of the design. A methane bio-digester captures the naturally occurring methane gas that is a by-product of human waste and converts the gas into a stored energy source for household stoves.

### **Principle 7—Design from patterns to details**

Designers must assess all available materials and energies prior to planning a project. Landscape patterns need to be analyzed before designing for a human imprint and existing patterns of vegetation help determine soil health and planting strategies.

### **Principle 8—Integrate rather than segregate**

Mature nature systems have mutual and symbiotic relationships between all elements of the system and permaculture designers work to create cooperative relationships in all aspects of design. Good design integrates short-term and long-term yields. Allowing weeds to be integrated into a vegetable plot rather than segregating the weeds through removal improves the soil quality because weeds attract beneficial microbes and insects.

### **Principle 9—Use small and slow solutions**

Systems should be designed to perform functions at the smallest scale that is practical and energy efficient for that function. The manipulation of systems in small ways creates measurable change and avoids any one single point of failure. Incremental design starts with a nucleus and builds outward. A design can begin with planting five percent of land with perennial plants, and once the production from the first year's planting begins, the percentage of perennials gets increased by an additional five percent each year, leading to a full rollover of the land within 10 years.

**Principle 10—Use and value diversity**

The more diverse the elements in a system are, the more diverse the yields will be. However, more diverse elements alone will not contribute to the health of a system unless the elements make connections among each other. It is the diversity of the connections that matters, and not just the raw diversity of elements. Incorporating animal associations and using animals as part of other agricultural operations can be seen as way to increase and value diversity. In addition to providing food yields, chickens can till and fertilize soil prior to crop planting, and once production has started, they eat insects and help control damaging insect populations.

**Principle 11—Use edges and value the marginal**

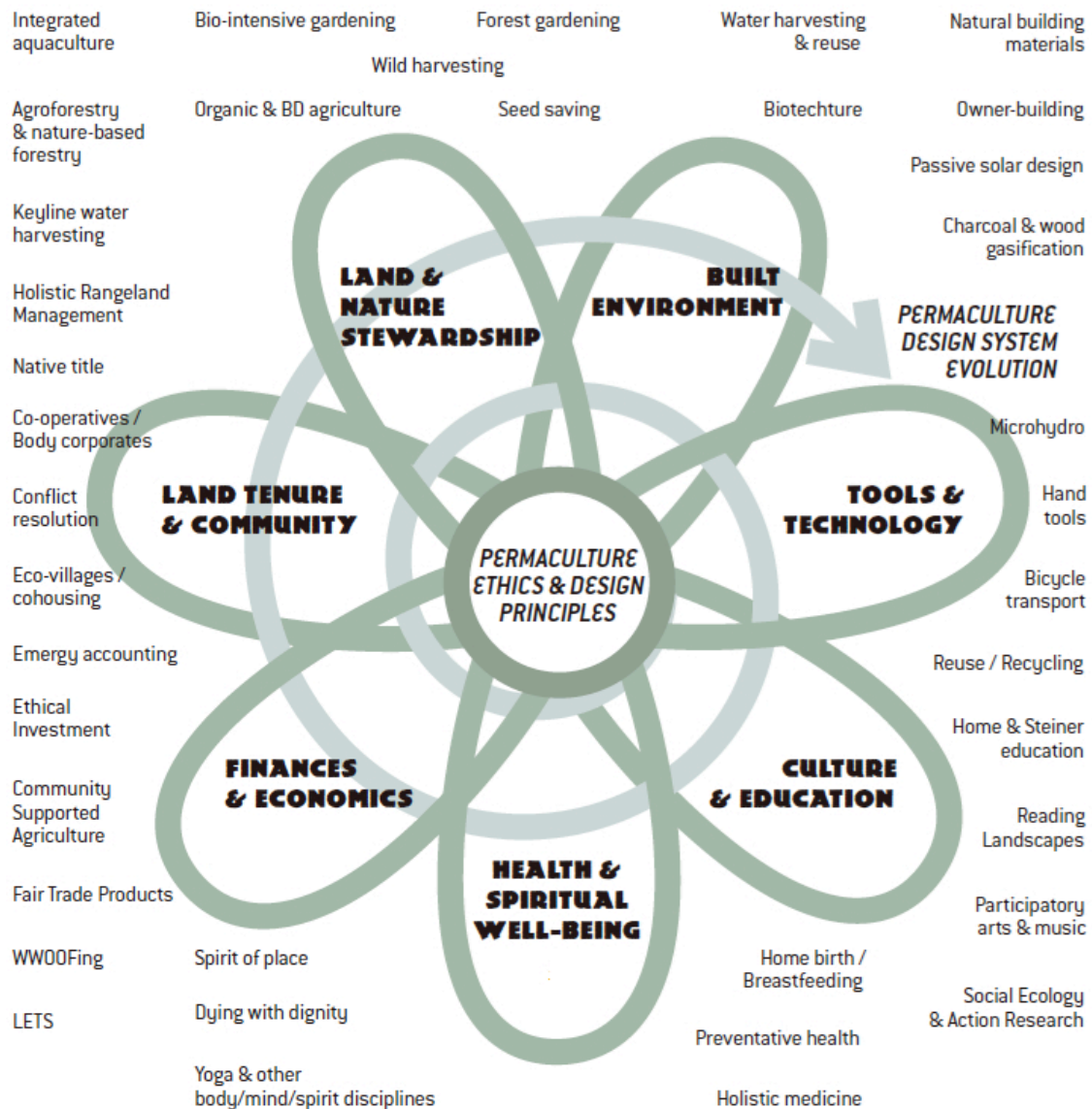
The edges between two systems have a higher variety of species and higher productivity than either isolated system. The design must intend to increase the edge. The edge of the forest has the strongest trees, and marshes are rich in biodiversity. If a pond is round, only 20 feet of blueberries will fit, but once the edge of the pond is crenellated, 30 to 40 feet of blueberries can be incorporated without significantly increasing the overall diameter of the pond.

**Principle 12—Creatively use and respond to change**

The design must make use of expected change and be prepared to respond to changes that cannot be planned. The durability and stability of a design comes from flexibility and

change. In design, animals and plant that thrive in low-energy conditions must be bred, or bendable trees should be planted in areas where intense winds or flooding may occur.

Holmgren (2002) created a flow image of a flower for visualizing the holistic permaculture system. The design ethics and principles serve as the center of the model and the petals represent the seven key domains for creating a sustainable culture through the application of permaculture (see Figure 1).



**Figure 1.** Holmgren’s Permaculture Flower (from *Permaculture Principles & Pathways Beyond Sustainability*; copyright 2002 by Holmgren Design Services and reprinted with permission of author).

The permaculture concept nests into the larger sustainable agriculture field, though the incorporation of design ethics is unique to the permaculture approach. The sustainable agriculture movement began in late 1970s and early 1980s, when the envi-

ronmental movement began to focus on damages to water systems that were linked to chemical agriculture. In 1983, the World Commission on Environment and Development released a report by the Brundtland Commission that conceptualized environmental degradation as an impediment to agricultural development (Buttel, 1993).

Sustainable agriculture has been described as an umbrella term encompassing several approaches to agriculture, including organic farming, ecological agriculture, regenerative agriculture, agro-ecology, and permaculture (Hansen, 1996). Conventional agriculture is characterized by capital-intensive, large-scale monocrops, and the extensive use of artificial fertilizers, herbicides, and pesticides (Hansen, 1996), while sustainable agriculture is characterized by small farms that rely on the management of internal resources and that limit purchased commercial inputs in order to reduce the negative ecological impacts of agriculture (Ikerd, 1993). While the differences in applied technologies between conventional and sustainable agriculture are significant, the main difference between the two approaches stem from differences in agricultural philosophy (Ikerd, 1993). According to Ikerd (1993):

the conventional model of agriculture is fundamentally an industrial development model which views farms as factories and considers fields, plants, and animals as production units. The goal of industrial development is to increase human well-being by increasing production of material goods and services...Sustainable agriculture is based on a holistic paradigm or model of development which views production units as organisms that consist of many complex interrelated suborganisms...People are



viewed as part of the organisms or systems from which they derive their well-being (p. 147).

The sustainable agriculture framework incorporates social values into the agricultural discourse such as decentralization, community, harmony with nature, self-sufficiency, and preservation of agrarian culture (Hansen, 1996). Yunlong and Smit (1994) describe agriculture as a complex process that takes place in a threefold environmental framework based upon the biophysical environment, the socio-political environment, and the economic and technological environment. The biophysical environment refers to the natural world within which agriculture operates, and is grounded in the need to maintain healthy ecological relationships. Ecological sustainability requires the preservation of physical conditions and the protection of biological diversity. The socio-political environment refers to the role that human relationships and culture have in influencing how agriculture is practiced. The social dimension of sustainability depends on the continued provision of current basic needs without decimating the environment for future generations. The economic and technological environment refers to the economic feasibility and production output of agriculture activities. Economic returns need to be sufficient enough for agriculturalists to continue producing agricultural products. Yunlong and Smit (1994) write, “for agriculture to be sustainable it must be biophysically possible, socio-politically acceptable, and technically and economically feasible” (p. 302). Holmgren’s permaculture flower model (Figure 1) is complementary with Yunlong and Smit’s (1994) threefold sustainability framework and incorporates the biophysical, socio-political, and techno-economical environments needed for sustainable agriculture.

Ikerd (1993) also discusses the social dimension of sustainable agriculture and proposes that sustainable agriculture is defined by its ability to conserve resources, protect the environment, produce efficiently, and enhance the quality of life for agriculturalists and the societies where they live.

Systems which fail to conserve and protect their resource base degrade its productivity and eventually lose their ability to produce. Systems which fail to protect their environment eventually produce more harm than good; they lose their usefulness to society and, thus, are not socially sustainable. Farming systems which fail to provide the people with adequate supplies of safe and healthful food at reasonable costs and otherwise enhance the quality of life are not politically sustainable (p. 151).

It is clear that sustainable agriculture goes beyond the confines of agronomy, incorporating social, political, and economic processes into the science of food production. Buttel (1993) describes the incorporation of the social sciences as the sociology of agricultural sustainability. According to Buttel, sociologists and other social scientists have played a significant role in the “emergence, institutionalization, and design of sustainable agriculture” (p. 175). He writes that the social science fields have an important and constructive role in helping to understand and assess agricultural sustainability. The present dissertation aims to develop a connection between the social science of conflict analysis and resolution with sustainable agriculture and to extend agricultural constructs to include peacebuilding.

Permaculture is an appropriate model with which to begin an exploration of the relationship between conflict resolution and agriculture due to its holistic approach to sustainable agriculture and its unique peace-oriented approach rooted in the design ethics and principles

### **The History of El Salvador**

In order to understand the role of permaculture in postconflict zones, it is important to review the relevant history of the small yet turbulent country of El Salvador. The Republic of El Salvador is located in Central America and is the most densely populated country in Latin America. Prior to Spanish conquest in 1528, El Salvador was populated by the native Pipil and Lenca Indians. The first native settlements date back to 1200 B.C., and the country thrived during the Mesoamerican period, developing a high degree of civilization and agricultural life and trade. During the Postclassic period (1000 A.D.–1550 A.D.), Indian society produced varieties of pottery, textiles, metals, art, honey, wax, cotton, beans, squash, corn, tobacco, chilies, cacao, salt, and dried fish, among other regional items. Indian society revolved around agriculture, with cacao and corn holding sacred status, and rituals accompanied planting and harvesting cycles. All of the land was communal. Weapons, stone ornaments, pottery, tools, indigo dye, and woven materials were also produced (White, 2009).

In 1521, the Spanish attempted to conquer El Salvador but strong Pipil resistance thwarted the first attempt. Conquistador Pedro de Alvarado invaded El Salvador in 1524, and by 1528 he had defeated the Indian warriors, instituting colonial rule and the

concentrated social and economic structures that would mark the country for centuries. Indian villages were forced to pay tribute to the Spanish landlord through a system called *encomienda*, and Indians paid by way of physical labor on the landlord's estate. The *encomienda* system was gradually transformed into a system of peonage where Indians began working on haciendas in exchange for small garden plots and housing (Browning, 1971). The Spaniards drew their wealth from agricultural products, as the country did not have vast silver or gold resources, and began exploiting the existing cacao and balsam products until the boom of the textile industry brought a demand for indigo and cotton. Land consolidation began as the Spanish increased their haciendas to accommodate plantation-style farming for the indigo, cotton, and sugar cane crops, and communal land began to disappear. Independence from Spain was won in 1821 and El Salvador becomes a state in the Federal Republic of Central America until 1838, when it declared itself an independent nation. The landed elite began to take economic, political, and military control of the nation. In 1881, the government eliminated all collectively-held land (White, 2009). The land was sold to wealthy families and the displaced were forced to become day laborers. Agricultural judges created laws that let landowners evict squatters as well as vagrancy laws that required peasants to carry identification cards listing the plantation to which they belonged (Browning, 1971).

In the 1860s, a coffee boom began in El Salvador in response to a decline in the indigo market. Coffee requires a more specialized environment for production and wealthy plantation owners expanded into the Indian lands of the volcanic highlands. By 1881, the government abolished the existence of communal land. The large-scale conver-

sion of the agricultural economy to coffee created a vast social and economic divide in the country and the landed elite formed a powerful oligarchy. Anderson (1981) writes:

The small farmer who had relied on the common pasture and woodland for part of his sustenance was forced into economic ruin. His land was taken from him by law, or by force and fraud, and a new class of wealthy *finca* [plantation] owners became the elite of the county. Many...now found themselves squatters on their land, and although a law was passed in 1884 allowing those who bought up these lands to expel them, they clung tenaciously to the soil with the stubborn persistence of their Indian ancestors. (p. 17).

The coffee crops did not require the same year-round attention that had been needed by the sugar and indigo crops, and soon, coffee plantations began to use hired hands instead of keeping a year-round workforce, leaving many rural poor without their small salaries. Rural men began to follow the harvest, moving from coffee to sugarcane to cotton. Domestic food production declined as a result of increased coffee production and worker migration patterns (Browning, 1971).

The majority of arable land became dedicated to export-oriented coffee production and the government sold uncultivated land to coffee producers. The coffee producers belonged to the upper and small middle classes that had the expendable income to wait out the five years that coffee plants require to mature and yield the first crop. Eventually, four-fifths of all the arable land was in the hands of several hundred coffee growing families (White, 2009). It was estimated that land values ranged from \$100 per *manzana*

(1.7 acres) in remote regions to \$500 per manzana in a good locations, even though the wage was 50 cents per day during this time period. Land became more valuable because it created easy access to cheap labor by landless workers who sought subsistence plots within the farms (Gould & Lauria-Santiago, 2008).

The Great Depression of 1929 had a dramatic impact on the Salvadoran economy when coffee prices dropped from 22.2 cents per pound in 1929 to 8 cents per pound in 1931(Gould & Lauria-Santiago, 2008). The coffee plantation owners responded to the crisis by cutting wages, and then cut out wages entirely and only provided one meal a day to workers.

The planters' response to the crisis merely exacerbated the situation for the rural poor. In addition to the pressing problems of below-subsistence wages, abusive working conditions, and growing land loss, Salvadorans also faced a food shortage. Throughout the late 1920s market forces, limited land for cultivation, and natural conditions made the county vulnerable to periodic food crises: while pushing many to the edge of starvation, these shortages also created opportunities for windfall enrichment for large-scale production and merchants. (Gould & Lauria-Santiago, 2008, pp. 23–24)

Farm workers began to organize and labor movements began, starting with the FRTS (Federation Regional de Trabajadores de El Salvador) that eventually was absorbed into the communist organization Socorro Rojo Internacional (SRI) and Partido Comunista Salvadorano (PCS), headed by Augustin Farabundo Martí (Montgomery, 1995). The

government instituted a ban on political meetings and the distribution of any kind of leftist literature. The military arrested union leaders and was called in to break up demonstrations, often by shooting into crowds of unarmed demonstrators or conducting mass arrests. The municipal elections in December, 1931, further radicalized the rural poor, mostly indigenous, political left. Policed blocked them from voting in the elections and electoral fraud spread throughout the government. After the elections, workers strikes increased, as did the use of military violence against strikers. Strikers and demonstrators began to respond with violence against their attackers. The SRI and PCS planned an insurrection for January 22nd, 1932. The government located the underground hideout of the movement's leaders, including Martí, and arrested them on January 18th, 1932. The revolt took place as planned on January 22nd in the western regions of the country, including Izalco, Sonsoante, Juayúa, Nahuizalco, Tacuba, and Ahauchapán. The revolutionaries attacked military barracks and city halls, and took over several municipal seats. They occupied towns and destroyed land records and, in some regions, looted stores for the distribution of products to the poor. It has been estimated that across all the regions, the revolutionaries killed 100 people, including 35 civilians, during the uprising (Gould & Lauria-Santiago, 2008).

The military did not respond immediately to the insurrection in the west until the attacks on the capital were repelled and the insurgent forces held Sonsonate and Ahauchapán for one night, and Juayúa, Nahuizalco, and Izalco for two days. However, once the military arrived, the government forces defeated the insurgents within three hours or less of combat in each zone. The revolutionaries, untrained for military combat

and yielding the same machetes they used while working on the plantations, were no match for the heavily armed forces which fired at close-range on the insurgents (Gould & Lauria-Santiago, 2008). This marked the beginning of the *La Matanza* massacre, which lasted into March of 1932. Gould & Lauria-Santiago (2008) divide the different stages of repression used during the massacre time period. Stage I consisted of the battle days and immediate aftermath. After defeating the insurgents, the government forces followed the retreating rebels into the countryside and engaged in indiscriminate killing of males as young as twelve years old and of women and children. The rural areas around Ahauchapán, Juayúa, Nahuizalco, and Izalco suffered several thousand deaths. Troops massacred groups of unarmed indigenous people. This first phase of repression involved the large-scale killing of both Indians and Ladinos (mixed blood), but there were a higher proportion of indigenous people among the dead. All *campesinos* were targeted and, unless a landlord could vouch that they did not participate in the uprising, were shot in large round-ups. During Stage II of the repression, two Indian massacres took place in Nahuizalco. Stage III overlapped with Stage II, but lasted longer and involved *las listas*, when the National and Civic Guards used the voter lists and petitions to find PCS and SRI supporters in order to kill them.

A Wall Street attorney, Milo Borge, was present in San Salvador during January 1932. In a report dated 30 January 1932 he wrote: “The Government has been arresting all those who were listed as Communists. I understand that in San Salvador, alone, there were 9,000 men listed. They are being arrested as rapidly as they can be located and after one or two



days in jail are taken out late at night and conducted to some isolated spot where they are told to disperse and machine gun fire opened on them. They are usually buried where killed. I understand about 600 have been so disposed of in this city alone during the past week.” (Gould & Lauria-Santiago, p. 227)

The exact figure of massacred Salvadorans is unknown but estimates range between 10,000 and 30,000 (Gould & Lauria-Santiago, 2008; White, 2009). What is agreed upon in the literature is that the *La Matanza* massacre decimated the native Pipil population in El Salvador and due to fears of being singled out as an Indian, many abandoned their native traditions in order to assimilate into the Ladino culture to escape government targeting (Tilley, 2005).

In 1933, the same government that was responsible for *La Matanza* created the *Junta Nacional de Defensa Social*, which was a social improvement fund aimed at redistributing land and housing for the poor. The plan had limited success due to the overwhelming numbers of people needing assistance (Montgomery, 1995).

The global cotton boom of the 1950s reverberated in El Salvador and the agroexport production of cotton began to take root in the country (Barry, 1987). Thousands of small farmers were displaced to make way for new cotton plantations, and basic food production declined even further. Although one acre of Central American soil could yield more cotton than any non-irrigated land in the world, cotton quickly exhausts the land and requires a great investment in fertilizers and pesticides. The cotton boom not only displaced more farmers but also began a systematic poisoning of the soil. Pesticides kill a

broad spectrum of living things, including insects which are beneficial to the corn and bean fields on which the peasant families depend on for food. Fifty to seventy-five percent of pesticides applied by crop dusters never reach the intended land, settling instead upon other agricultural lands, waterways, livestock, and people (Barry, 1987). The use of pesticides was particularly devastating in El Salvador due to the small size of the country and the high volume of organochlorine chemicals used, such as aldrin, DDT, endrin, and dieldrin. Growers soon started using organophosphates, which degrade faster than the decades required by organochlorines, but carry a significantly higher toxicity for farm workers. The organophosphate parathion is sixty times more toxic than DDT, and in the 1970s, it was estimated that one-fifth of the world's parathion supply was applied in El Salvador (Barry, 1987). Farm workers and the land both suffered from high levels of toxicity, and ultimately, vast areas of land were left sterile after the input costs exceeded the profit margin of cotton. The cotton boom left a legacy of toxic chemical use that has contributed to rapid environmental degradation.

The landless population continued to grow as did their demands for agrarian reform. In 1976, President Arturo Molina attempted to institute an agrarian reform plan but the oligarchy refused to concede land for redistribution, even though the plan only impacted less than four percent of the total agricultural land (Montgomery, 1995). The oligarchy increased repressive activity and began to use death squads to quell any attempt at redistributing their holdings (Montgomery, 1995). The Molina Presidency also targeted university students with leftist ideas and ordered the military to occupy the three campuses of the University of San Salvador. As the attacks on unarmed protesters increased,

originally nonviolent resisters began to believe in the necessity to take up arms against the government. The government repression of the 1970s served as a rallying point for the guerilla army among the poor, working class, and intellectuals. Election frauds plagued the decade and the election of 1977 culminated in a protest in San Salvador's Plaza Libertad which drew fifty thousand protesters and ended with the National Police attacking the crowd and killing close to fifty people (White, 2009). Revolutionary groups began kidnapping upper elite members and killing military personnel.

In 1977 President Carlos Humberto undertook a relentless campaign of repression that began to galvanize the countryside once more and spurred a resurgence of popular movements. President Humberto was overthrown by a military-civilian junta in 1980 with the civilian participants coming from the oligarchy power structure. The governmental junta, headed by Christian Democrat Napoleon Duarte signaled a change in power from away from the extreme right and Christian Democrat party attempted to govern the country from a middle of the road position. The junta created a three-phase agrarian reform program and nationalized sectors of the economy (Montgomery, 1995). The United States backed Duarte and designed a counterinsurgency war aimed at pacifying the restless poor to prevent a resurgence of rebellion in Central America. The main components of the strategy aimed to shift the balance of power away from the highly reactionary landed oligarchy, create a political power base from a centrist government, and prevent the radicalization of the peasantry. The agrarian reform program was divided into three categories of land appropriation and distribution. The plan was designed to create a sector of conservative small farmers and establish a network of cooperatives

organized by the American Institute for Free Labor (Barry, 1987). Phase One targeted estates with more than 1200 acres, which covered ten to fifteen percent of the country's arable land. The Phase One land was to be redistributed to newly formed cooperatives made up of former full-time employees of the expropriated estates. Seasonal laborers and plantation workers on the same lands were excluded from the reform which undercut the effectiveness of the reform in assisting vulnerable rural populations. Phase Two focused on holdings of between 220 and 1200 acres, which constituted about twenty percent of the nation's farmland. This phase directly impacted the oligarchy. The oligarchy provided such a strong opposition to the plan that Phase Two was never implemented. Phase Three dealt with all the rental lands smaller than seventeen acres, which covered approximately ten percent of the farmland and made the peasants who were cultivating that land eligible to apply for the title to the land. Potentially, forty to forty-five percent of the nation's land was to be redistributed but preemptive evictions by landowners actually increased the landless population in the countryside (World Bank, 1998). The day after the land reform decree was announced, the military portion of the junta declared a state of siege and the land distribution process was used by the military as an opportunity to demonstrate their control in the rural areas by eliminating peasant agitators (Barry, 1987). For the campesinos, agrarian reform became synonymous with army terrorism.

The bloodletting frequently occurred following the election of cooperative leaders. Local commanders waited to see who the peasants considered their best representatives and then moved in for the kill. In some cases, the army used its power to protect the interests of the landowners and block

the transfer of Phase One and Phase Three lands to the claimants. One instance of landlord/army collusion involved a community of 300 potential claimants of Phase One lands. Due to threats, only 40 families applied for the title; of those, 27 were murdered by soldiers and the rest gave up their claims....In addition to direct military violence, the reform beneficiaries were also victims of paramilitary violence by death squads. (Barry, 1987, p. 116–117)

The land reform did not redistribute land without cost to the beneficiaries and the Phase One cooperatives were given 30 years to pay back the value of the land to the government. In 1984, a USAID internal audit revealed that the land reform project was riddled with financial problems, and in a 1985, the report concluded that Phase One cooperatives could not meet their land purchase payments and incurred a debt close to a billion dollars by 1986 (Barry, 1987). Additionally, USAID reports concluded that the Phase One cooperatives had no working capital, labor surpluses, weak management, no technical assistance, and about forty-five percent of the Phase One lands were nonproductive and the rest of the land was of poor quality (Barry, 1987). Overall, Phase One fell short of initial projections and over sixty-five percent of the estates scheduled for appropriation were left untouched, while less than half of the initially estimated cooperatives received definitive titles. Phase Three was also less successful than planned, with only eighteen thousand of the one hundred and seventeen thousand potential beneficiaries being granted permanent land titles.

Peasants have become neither food self-sufficient nor economically independent through their participation in Phase Three. Most of these parcels cannot sustain continuous food production and need to be left fallow for a year or two before replanting. Yet the beneficiaries are tied to the land for as much as thirty years. Former tenant farmers are thus paying for land they cannot farm each year...A 1981 evaluation by US AID consultant Dr. Norman Chapin concluded that if cultivated every year most Phase Three plots “would be converted into sterile desert.” (Barry, 1987, p. 118)

It is estimated that about eight percent of the rural poor received definitive titles to redistributed land, which was a far cry from the initial projections of one-half to two-thirds of the population receiving benefits (Barry, 1987).

1980 proved to be a turning point year for the country. In January, a demonstration of two hundred thousand people memorializing the 1932 *La Mantanza* massacre ended with forty-nine dead and hundreds injured by government forces (White, 2009). In March, Archbishop of San Salvador Oscar Romero, an advocate of liberation theology and nonviolent resistance, was assassinated while leading a Mass service. His funeral drew over two hundred and fifty thousand mourners and ended with the crowd being subjected to smoke bombs and gunfire. Approximately fifty mourners died (White, 2009). By October, the previously separate revolutionary groups joined together to form the FMLN (Farabundo Martí National Liberation Front) (White, 2009). In 1981, Major Roberto D'Aubisson, the head of the notorious *Mano Blanco* death squads, founded the

right-wing political party ARENA (Nationalist Republican Alliance), which would rule Salvadoran politics for over twenty-five years (White, 2009).

In December of 1981, the single worst massacre of the war took place at *El Mozote*. A battalion of U.S. trained Salvadoran soldiers, called the Atlacatl Battalion, killed between seven hundred and nine hundred unarmed civilians (White, 2009). Roberto D'Aubisson won the presidency in 1982 and took control of the Ministry of Agriculture and Land Reform Agency and blocked redistribution of land. In 1983 the Constituent Assembly passed a new national constitution that guaranteed landowners the right to rent out their property and raised the maximum size for private landholdings to six hundred and five acres (Barry, 1987). The civil war raged on from 1980 to 1992, claiming between seventy-five and eighty-two thousands lives. The Peace Accords were signed in Chapultepec, Mexico on January 16, 1992 (Eriksson, Kreimer, & Arnold, 2000) The details of the civil war are numerous, but of particular interest to the current research was the impact that the civil war had on the land and environmental conditions in El Salvador.

The Salvadoran army implemented a scorched-earth policy in their war against the guerilla army. Since the guerillas controlled large zones of the countryside, the majority of the armed fighting took place in rural zones. Both sides planted dangerous land mines. The government forces also carried out systematic bombings of guerilla support zones using both napalm and white phosphorous (Clements, 1984). Hedges (1984) quotes a Salvadoran soldier from the Fifth Battalion as stating, "Usually we drop incendiary bombs before we begin operations in the area around the volcano...By the time we enter the area, the land has been burned over, and the subversives pretty well toasted"

(p. 1). According to Hedges, soldiers from the Fifth Battalion and the elite Atlacatl Battalion said they saw small villages in the [Guazapa] area burned to the ground and large tracts of land charred by incendiary bombs (p. 2).

In October 1984, the *New York Times* reported that the commander of El Salvador's Air Force admitted using incendiary weapons against guerilla forces ( Hedges, 1984, p. 9). The government forces would also set fire to communities and villages during their sweeps for insurgents. An interviewee for MacDonald and Gatehouse's book *In the Mountains of Morazán* (1994) describes this period of time:

We were only able to survive by staying a few days here, a few days there....There'd be a few months between operations, when people who'd stayed put, all dispersed, would come out of hiding and work for a bit, grow some things to eat. And when the next operation came in, the people went back again to where they were a bit safer, where the army couldn't find them and their families. And each time they'd start again on the scorched earth and the army would burn it all again. They kept on burning the houses and the crops over and over again. (p. 122)

Another interviewee described the state of the land when the refugees returned: "From the river northward, people tell us all those crops [maguey] were completely destroyed by the war. You see, the soldiers wanted to see everything done away with, down to the vegetation. They set fire to it every six months: trees, plants, fruit trees, houses, everything" (McDonald & Gatehouse, 1994, p. 7). MacDonald and Gatehouse described the post-war landscape:



[T]he change is largely the result of war. Bombed, mined, burned, and abandoned, this land has been virtually uncultivated for a decade. The green hills of Morazán give way here to wild, scrub-covered hillsides, sparsely shaded by trees that got away, and raw red scars of bare earth.

(p.7)

These descriptions of burned earth echoed throughout the rural zone of the country, and land that was already heavily saturated with toxins from agrochemicals was damaged even further by constant bombing and fire setting. The military offensives not only impacted the human communities, but also the weather patterns and animal and insect life in the richly biodiverse volcanic zone. A resource specialist who had studied the genetic diversity of the region was quoted by Hall and Faber (1988) as stating, “The war has caused the disappearance of many species in the region” (p. 135). They also quote the advertisement that community leaders of Perquín in the Morazán Department took out in the newspaper in 1988 to protest the Salvadoran government’s actions during the war:

We are very worried by the grave damages caused by the devastating forest fires caused by aerial bombing and indiscriminate mortar fire, as well as by soldiers carrying out patrols and operations. The armed forces commonly burn the forest during the dry season, accelerating the destruction of resources in the zone, including natural forests, logging areas, coffee crops, and food crops. Because they have deforested large areas in our zone, the scorched earth and bombing campaigns have notably affected rainfall patterns. The length of the rainy season has shortened, and the lev-

els of streams and rivers have dropped. The situation is becoming more critical. (Hall & Faber, 1988, p. 134)

- The signing of the peace accords between the FMLN and the Salvadoran government ended twelve years of violence and began a new era of reconstruction in the country. According to Eriksson, Kreimer, and Arnold (2000), key aspects of the Chapultepec Peace Accords included:
- limiting military control to national defense and placing it under civilian control;
- abolishing the treasury police and national guard and creating a national civilian police force;
- reforming the electoral and judicial systems;
- establishing a human rights counsel; and
- creating a Land Transfer Program for ex-combatants and civilian supporters.

The Peace-Accord Mandated Land Transfer Program (PTT) originally was set to distribute 166,000 hectares of land. Fifteen thousand combatants of the Salvadoran armed forces, 7500 FMLN combatants and 25,000 FMLN-supporting farmers that were displaced during the war were eligible beneficiaries of the program (World Bank, 1998). The early phases of the land transfer were slow going, and the level of participation of potential beneficiaries declined. In the end, 78,000 hectares, or approximately 192,000 acres, were distributed among 30,000 beneficiaries (World Bank, 1998).

During this reconstruction period, a gentleman by the name of Juan Rojas returned to El Salvador after fleeing the country in 1980 due to his ties with the labor movement. Initially, he had fled to Mexico where he became involved in founding a Salvadoran refugee coordinating group and he was a vocal advocate for the revolutionary cause in El Salvador. He was asked to leave Mexico due to his solidarity work and was granted political refugee status in Australia (Wilson, 2007). In Australia, he studied under permaculture creators Bill Mollison and David Holmgren. After the signing of the peace accords, Rojas decided to return to El Salvador and assist with the reconstruction efforts by developing permaculture and sustainable-living practices in war-damaged communities. He was working with the Christian Base Communities of El Salvador (CEBES) when he was invited to a meeting hosted by the Mesoamerican farmer-to-farmer movement. The meeting brought together individuals with ecological agriculture backgrounds in the hopes of revitalizing the farmer-to-farmer movement in El Salvador. Juan Rojas, Lorenzo Viagas, and Leonico Rodriguez joined together to start a farmer-to-farmer project in Morazán and they began exchange programs between farmers and permaculture training programs. According to Wilson (2007), Rojas decided to work in Morazán precisely because the zone was so heavily damaged by the war and the zone was also receiving large amounts of reconstruction funding and aid.

Rojas wanted to help with the reception of foreign aid and encourage sustainable development and permaculture practices. Starting from scratch intrigued him. The military had used scorched earth tactics and poisoned the

land. He found the farmers to be receptive to the practices and supportive of his effort to revitalize farmlands in this area. (Wilson, 2007, p. 81)

In 1998, the Christian Base Communities of El Salvador (CEBES) funded a second farmer-to-farmer commission in La Libertad, and both commissions taught permaculture techniques, as each of the leaders had permaculture design certificates. In June 2002, the group leaders decided to become independent from CEBES and formed The Permaculture Institute of El Salvador, and by 2003, the institute became a registered nonprofit.

The Permaculture Institute of El Salvador (IPES) continues to use the farmer-to-farmer methodology, which is a modified “train the trainer” approach, in educating rural communities in permaculture practices and sustainable development. They train community leaders to be permaculture promoters in their communities and eventually promoters in other new permaculture communities. IPES originally developed a permaculture demonstration site in La Florida, La Libertad that served as the teaching center until IPES relocated the demonstration site to Suchitoto in 2007. Suchitoto is close to the nation’s capital and this central location facilitates travel for rural promoters and prospective communities.

When a community expresses interest in learning about permaculture, they are invited to the demonstration site to view examples of the techniques they will be taught. Following the initial visit, IPES conducts a one-day training where the community learns the structure of the curriculum and the farmer-to-farmer methodology. After a community decides to make a three-year commitment to the project, IPES provides initial start-up support by sending promoters from other communities for a volunteer day and provides

frequent visits from IPES promoters. IPES also conducts permaculture design certificate courses once or twice a year, depending on available funding. The communities are responsible for acquiring the needed materials to commence the permaculture projects.

Recently, the IPES communities have begun a native seed exchange that is critical to rehabilitating the biodiversity of the food crops in El Salvador. The communities that IPES has worked with are isolated rural communities that are primarily made up of people who were displaced during the war and returned to destroyed land or of new refugees' communities. Many of the participants are ex-guerilla combatants or FMLN supporters, but IPES works with all political parties, and in several communities the permaculture work has transcended traditional party lines. The rural zones are characterized by extreme poverty and a lack of access to potable water and sanitation, and are at risk of impact from natural disasters. IPES attracts participation from both men and women, which is rare for an agricultural NGO in El Salvador, and several indigenous communities participate as well. IPES has used permaculture techniques to address the pressing needs of these communities by incorporating the following solutions to local problems:

- water harvesting
- solar water filtration
- composting latrines
- drip irrigation systems
- soil rehabilitation

- home food gardens
- natural pest control
- native seed use and conservation
- wood-saving stoves
- natural shampoo production

This is not a comprehensive list of permaculture activities supported by IPES, as the nature of permaculture is to constantly study evolving conditions and create solutions that respond to the constant change in nature. Some promoters are experimenting with aquaculture and attempting to create small fisheries, which were traditionally present in their landscape, and others are experimenting with planting patterns, creating natural herbicides and pesticides, and developing green manures.

## **Chapter 3: Research Methods**

This qualitative study explores permaculture in rural communities in El Salvador. The case study is both descriptive in documenting the experiences of permaculturists, and theory-building in providing empirically grounded insights into permaculture as an environmental peacebuilding tool.

Since permaculture has not been systematically researched, the descriptive research goals include:

- Providing insight into how permaculture is experienced by practitioners and their communities.
- Documenting a historical description of permaculture in El Salvador which may be useful to other permaculture practitioners, particularly in postwar zones.

Moving beyond the descriptive account, this dissertation addresses a significant gap between the theory and the practice of environmental peacebuilding. There is limited research on how communities impacted by war-related environmental damage cope with that damage. This research explores the environmental consequences of civil war in El Salvador. By studying permaculture, we can see in practice how individuals and communities work to heal these consequences and build peace.

## **Methodology**

The research design is a holistic single case study of permaculture practitioners in El Salvador. A single case design is useful when a case consists of a phenomenon that has previously been inaccessible for research, thereby creating the need for a revelatory case study approach (Yin, 2003). Since this is the first academic study of permaculture as peacebuilding in postconflict zones, a single case design was appropriate. However, I conducted interviews with permaculturists representing several different regions of the country and my field observations took me to four different communities. Therefore, it is only in the aggregate data analysis format that the study becomes a single case design. The four communities visited in person were El Franco, Papaturo, Palo Grande, and El Roble, all located within the department of Cuscatlán. The remaining interviewees represented various communities within the departments of San Salvador, San Vicente, La Libertad, and Morazán.

Interviewees were recruited by posting a flyer at the office of the Permaculture Institute of El Salvador (IPES) and by presenting a summary of my research at a monthly IPES organizational meeting, framed as an investigation into permaculture practitioners' personal experiences with permaculture. All of the interviewees included in this research had an affiliation with IPES since it was the only recruiting source available for locating permaculture practitioners in El Salvador. IPES was preparing for new training sessions, and during the initial days of field work in Suchitoto, the director of IPES invited me to attend a permaculture tour and training session that was being conducted for a prospective community. I observed the training session and participated in the tour of the IPES



demonstration site. I began interviews approximately ten days into my time in El Salvador, once a driver could be arranged to accompany me to the offsite locations. I arranged to interview those volunteers who were not within traveling distance during the following month's organization meeting. Interviewees represented permaculture practitioners with formal design certificates and non-certificate holders. Permaculturists associated with IPES are either permaculture design course trainers and/or promoters, or are permaculture practitioners, though the distinction is arbitrary because the farmer-to-farmer teaching methodology utilized by IPES does not limit teaching to persons labeled as trainers. Everyone who practices permaculture is a trainer. The distinction in terms is based upon salary status within IPES. Persons labeled as trainer and/or promoter are supported with a salary or stipend from IPES and have more organizational responsibilities, while practitioners teach permaculture within their communities with the support of an IPES promoter.

The age range of the interviewees was between 19 and 70, with the 35 being the average age of the interviewees, and the 22-person sample was evenly split, with 11 men and 11 women participating. Although the research had a dual aim of researching the role of permaculture in practitioners' lives and the application of permaculture as a postconflict environmental peacebuilding tool, interviewees and communities were not selected based upon possible war experiences or war damage. The only interview question that indirectly mentioned the civil war was a question aimed at assessing environmental changes over a span of 15–20 years that included the years of the civil war. The interviews took place over a span of two weeks, and during times when I was not conducting

fieldwork, I was observing work at the demonstration site, writing up field notes at the IPES office, or reviewing secondary documents.

Arriving at the interviews was difficult, since the rural communities were quite isolated and it was a one- to two-hour walk to a main road. I had the good fortune of arriving via vehicle, but the roads, which were not paved and were littered with dangerous rocks and slippery with mud, were difficult to maneuver, even for the skilled driver who escorted me. I held my breath several times during the journeys, when I thought for sure we were going to plunge off the road and down the mountain, and the remoteness of the areas certainly didn't escape my attention. Upon arriving at the communities, the interviews took place outdoors, and ranged between 30 and 90 minutes in length. Depending on the community I was visiting, I sometimes conducted the interviews in a group format.

The interview process was culturally foreign to some of the research participants and I noticed that people would talk more freely when they were not answering the questions one-on-one with me, so I adapted the interview structure to suit the cultural conditions of the field and to make the research participants feel more comfortable. I found that the interaction between the interviewees created rich data and that the interviewees would in fact play off each other and speak more freely. The interviewees were given the opportunity to answer each of the questions on the interview schedule and they often moved back and forth between the present question and previous questions from the interview as new thoughts emerged. After each of the four onsite interviews, I was invited on a tour of the interviewees' land to observe their permaculture practices. The

tours provided an opportunity for the interviewees to teach me about tropical permaculture and many of them were excited to show me the native vegetables and plants in their region. My background in permaculture provided the opportunity to engage with the interviewees in a manner they felt comfortable with and concluded the interview sessions positively.

I met several of the interviewees from the onsite communities multiple times in Suchitoto when I would visit the IPES demonstration site or they were visiting the IPES office or they came into town for supplies and we crossed paths. My last day in Suchitoto coincided with the visit to Suchitoto by El Salvador's President Mauricio Funes, the first FMLN candidate to win the presidential election, to inaugurate the Salvadoran month of civic duty that celebrates the nation's independence from Spain. It was a momentous event because it was the first time that the inauguration did not take place in the capital and it was significant politically because Suchitoto was known as an FMLN stronghold during the civil war. It had been less than three months since President Funes' historical election and it was the first opportunity for many people from Suchitoto and the surrounding areas to see him in person since his term in office began. The day began early, with a series of parades by various ages of school children playing traditional music and dancing their way down to the main plaza. The IPES organization meeting happened to be taking place at the same time, and once the moment drew near for President Funes to speak, the meeting adjourned and everyone went down to the plaza to hear the speech. The presidential speech was very moving and focused on the struggle of the poor in El Salvador and how every citizen has to contribute to making the country stronger, based

on social justice for all. It was a fitting end to my field work, and as the festivities wound down, I said my goodbyes to the interviewees that were there and to the IPES support staff.

Since the aim of this research is to create a theory of environmental peacebuilding based upon permaculture, a grounded theory approach to analysis was selected. Grounded theory was first introduced by Glaser and Strauss (1967) as a methodology “aimed to move qualitative inquiry beyond descriptive studies into the realm of explanatory theoretical frameworks, thereby providing abstract conceptual understandings of the studied phenomena” (Charmaz, 2006, p. 6). Grounded theory provides a process whereby theory is derived, or rather emerges, from the data itself through an inductive process of data collection and analysis. Analytic codes and categories emerge from the data and in vivo codes are created based upon the language of the research participants. Grounded theory requires the researcher to write memos to assist in the development of theory regarding the codes and categories and serve as a documentation of the process. At its core, grounded theory seeks to define the relationships between categories in manner that provides a theoretical framework to explain observed phenomena. For a comprehensive discussion of grounded theory methodology, see Glaser (1992), Strauss & Corbin (1998) and Charmaz (2006).

Grounded theory uses a simultaneous process of data collection and analysis that prompts the researcher into engaging in the participants’ language and meanings early on in the research process. By employing this approach to data collection, I was able to identify adjustments that needed to be made to my data collection process. As I previ-

ously described, I noticed that participants who were interviewed on their own gave significantly shorter answers that lacked the detail that I would get from talking with them after the interview officially ended and we sat around speaking with other people. I noticed this initially on the way home from the interviews and when I reviewed my field notes at night, it was clear that my notes of the conversation after the interview were much more rich in content than the yes/no answers I was getting during the interviews. I decided to conduct the third interview with two people and the experience was completely different and the interviewees appeared to enjoy the process more. Interviews were a foreign concept for many of the participants and some mistook the interview for a test on permaculture until I explained the project and reviewed the consent form. By moving into a group interview approach, the participants were able to engage in a conversation rather than answer a defined set of questions. Even though the interview schedule did not change, the perception of the interview did.

Reviewing the interviews while collecting data also allowed me to identify the need to change terminology to match the language of the participants. The first major change was in my emphasis on permaculture design principles. I was interested in finding out how the participants viewed the design principles but quickly found out that they did not learn about permaculture in the theoretically heavy approach that I did. The design course I attended, like most, primarily focused on learning the design ethics and principles separately from learning permaculture techniques, but when I asked questions about the design principles, they fell flat. After a few interviews, I asked the director of the institute if they covered the design principles in the design course and she explained that

they teach the principles through practice more than by rote memorization; therefore, I decided to remove the formal design principle questions from the interview schedule. However, when I coded the data, the interviewees often spoke about the design principles in the context of their permaculture practice. By removing the formal research question, I actually created the opportunity for the design principles to emerge from the data organically.

Another compelling change that emerged during the data collection was my use of the word *project*. My original interview questions described permaculture in terms of projects, but I was very quickly corrected by the interviewees that they do not call them projects. Early on in the interviews, an interviewee explicitly told me that they do not call them projects and that permaculture is a lifestyle to them. It was an important distinction. While it was limited to that one interview initially, other participants also corrected the use of the word project and I modified my term to permaculture practice, which more closely represented how they viewed permaculture in their lives. This change created the opportunity for me to explore permaculture integration in practitioners' lives which would have been missed if I had not constantly been reviewing my data during collection.

Traditionally, grounded theory researchers do not conduct extensive literature reviews prior to collecting their data to avoid bringing the lens of previous work into the research arena beyond what their academic exposure has given them. I purposefully did not conduct a literature review on the civil war in El Salvador prior to conducting the interviews so that I would learn about the war through the experiences of my interviewees. This was perhaps the most valuable aspect of the grounded theory approach to data

collection because it provided the single most important turning point in my fieldwork. By allowing myself to learn about the war through my participants first, I had the great opportunity to actually experience the progress these war-impacted communities had made rather than seeing them as places where horrific violence had taken place. Perhaps the biggest testament to the power of permaculture was that I had no idea that I was in fact standing on one of the most bombed regions in Latin America, where approximately 4,000 tons of bombs, including napalm and white phosphorous, had been dropped during the war.

Reserving the literature review on the civil war not only allowed me to focus on the permaculture innovations more closely when I was in the communities, but also enhanced my appreciation at the incredible amount of environmental and social healing that has taken place. When I told the interviewees in Palo Grande that I wanted to come back to their community on my next trip because it was the most serene, peaceful place I had been to, I had no idea that I would later read accounts of relentless bombings, starvation, massacres, and torture which would bring me to tears. The juxtaposition of visiting Palo Grande as a model community for permaculture and sustainable living and the horrors of events that happened less than 18 years prior unsettled and inspired me equally. Of course I was delighted that my original theoretical hunch that permaculture could be framed as a peacebuilding tool seemed to be taking shape before my very eyes, and yet I was humbled and unsettled because in this case, the peacebuilding I was witnessing came after such violence—the violence that these interviewees and fellow permaculturists had lived through. Theory-building moved from an abstract concept into

reality for me in a way I had not anticipated and ignited in me a passion to understand and explain what I was actually seeing and hearing during my research. Through the process of engaging and analyzing the interview data, I hope to bring light to the dynamics of permaculture as a transformative peacebuilding process. Staying true to the grounded theory approach, I have chosen to use the voice of the interviewees whenever possible in discussing the data analysis. It is their permaculture experience that we are learning from and their voice is the most valuable to generating grounded theory. Below is a short summary of each interviewee:

#### **Interview 1: Oscar**

Oscar lives in El Franco, which is a remote community located in the Sierra of Guazapa. Oscar is approximately 40 years old and is a permaculture practitioner and an IPES promoter. Oscar is originally from El Franco but left during the peak of the war. El Franco was subjected to heavy bombing during the war. Oscar was a FMLN supporter during the war.

#### **Interview 2: Tomas**

Tomas lives in La Libertad and works as the head permaculturist at the IPES demonstration site. He is approximately 40 years old. He practices permaculture on his own land and works as a lead trainer for IPES.



### **Interview 3: Miguel**

Miguel lives in La Florida on a coffee cooperative that was founded during the land reforms that took place in the late 1980s. He is approximately 35 years old. He practices permaculture on his own land, manages projects at the IPES demonstration site, and is a lead trainer for IPES. Miguel was orphaned during the civil war and, at the tender age of 9, was forced to take care of his younger siblings.

### **Interview 4: Elesseo and Alejandro**

Elesseo and Alejandro live in Papaturo. Elesseo is approximately 70 years old and Alejandro is approximately 50 years old. Elesseo and Alejandro are both permaculture practitioners but they have not completed their design certificates. Both Elesseo and Alejandro were settled in Papaturo after the war.

### **Interview 5: Angelica, Isabel, and Paco**

Angelica, Isabel, and Paco live in Palo Grande. Angelica is approximately 28 years old, Isabel is approximately 40 years old, and Paco is approximately 70 years old. Each of them has a personal practice of permaculture and each works as a promoter for IPES. The Palo Grande community serves as the main demonstration community for IPES, and communities that are interested in permaculture come tour Palo Grande to experience a community approach to permaculture. All three interviewees are originally from Palo Grande and returned to the community after the war. Palo Grande was subjected to intense bombing during the war.

**Interview 6: Karen**

Karen is the director of IPES. She is originally from England and has a background in community development. She came to El Salvador to support the creation of the formal institute. She is approximately 50 years old. She is the principal teacher for the permaculture design certificate course and has had a personal permaculture practice for 13 years.

**Interview 7: Carmen and Fermin**

Carmen and Fermin live in El Roble. Carmen and Fermin are permaculture practitioners but they do not have their design certificates. Carmen is approximately 45 years old. Fermin is approximately 25 years old. Both are originally from El Roble but left during the height of the war. El Roble was subjected to heavy bombing.

**Interview 8: Elizabeth**

Elizabeth is an American citizen who is in El Salvador to learn about organic agricultural practices. She is approximately 30 years old. She was working on a private organic farm prior to connecting with IPES. She began to work at the IPES demonstration site approximately one month before this interview. She did not have permaculture exposure prior to working at the IPES demonstration site.

**Interview 9: Reina**

Reina currently lives in San Vicente and is approximately 45 years old. In addition to her personal permaculture practice, she serves as a regional permaculture promoter for IPES.

As a child, she worked on cotton plantations, and once the war broke out, she and her family were forced to flee their community. They resettled in San Vicente after the war.

**Interview 10: Gertrudis and Noemi**

Gertrudis and Noemi live in La Florida. Gertrudis is approximately 30 years old and Noemi is approximately 60 years old. Noemi was an active guerilla combatant during the war and worked to reintegrate ex-combatants after the peace accords. In addition to their personal practices, Gertudies and Noemi work as permaculture promoters in La Florida.

**Interview 11: Valentin, Regino, and Norma**

All three interviewees live in Morazán. Valentin is one of the youngest permaculture promoters and is approximately 19 years old. Regino is approximately 30 years old and his father was one of the founding members of IPES. Norma is approximately 40 years old. Each of them has a personal practice and works as a promoter in the community.

**Interview 12: Thelma and Maria**

Thelma and Maria live in Tecoluca. Thelma is approximately 35 years old, as is Maria. Each of them maintains her personal permaculture practice while also working as a promoter for IPES and serving as a women's advocate in the community.

**Interview 13: Miguel and Ricardo:**

Miguel and Ricardo work for the national organic agriculture organization called MAOES. Miguel is approximately 45 years old and Ricardo is approximately 30 years

old. They live in San Salvador and provide permaculture training as part of their organic agriculture courses in rural settings. They have recently designed the first urban permaculture course to be taught El Salvador.

As previously mentioned, the transcripts of the interviews are the primary data source for this dissertation. Transcripts were entered into the *atlas.ti* qualitative analysis software package. *Atlas.ti* is a software package that was designed to support grounded theory analysis. A code book was developed to assist with initial coding and the code book was modified to accommodate *in vivo* or emergent codes as the data analysis progressed. Data were coded in paragraph units and once the data was coded, I created network views to assist in clarifying relationships between codes. Since this is an exploratory study, I had to delve into each of the codes to understand its stand-alone properties before I could fully evaluate the relationships between the codes.

The data analysis will be presented in five chapters. The first three chapters of the data analysis are organized around the guiding research questions:

- *Does permaculture impact multiple levels of practitioners lives?*
- *What are the challenges faced when implementing permaculture and how do practitioners respond to conflict?*
- *How does the postconflict context impact the practice of permaculture?*

The fourth chapter will discuss themes that emerged from the interview that were not part of the original research questions. The fifth chapter provides an analysis and reflection of each of the separate interviews. A grounded theory of environmental peace-

building based upon the experiences of permaculture practitioners in El Salvador will follow the data analysis.

## **Chapter 4: Does Permaculture Impact Multiple-Levels of Practitioners Lives?**

Since the role of permaculture in the lives of permaculturists in postconflict zones has not been systematically researched, the semi-structured interview schedule was constructed to assess five domains of experience: environmental conditions, living conditions, food security, permaculture personal impact, and permaculture community impact (for full interview schedule, see Appendix A). A grounded theory approach to both data collection and data analysis revealed two additional domains of experience: health and permaculture improvement. When I created the interview schedule, I expected health issues to nest into the larger domain of living conditions, but once I began to conduct interviews, it became clear that health was a very important issue and a separate topic from living conditions. Overall, health was discussed 27 different times in the interviews but only four times was it discussed in conjunction with living conditions. The permaculture improvement domain emerged during data analysis to capture improvements created through the application of permaculture technology. Each of the main domains was analyzed in-depth to provide insight into patterns within and between the domains.

The research question was aimed at documenting the experiences of permaculturists, investigating if permaculturists had experiences across life domains, and exploring if the experiences displayed a pattern. Since permaculture can be defined as an agricultural

technology, it was unclear whether permaculturists would be personally impacted by participating in permaculture projects or if they would view their participation as having an impact on the environment or larger community. Data analysis reveals that, indeed, permaculturists have experiences across domains and often describe combinations of domains during interview responses. Additionally, the interviews document a transition from permaculture innovations addressing local environmental conditions to permaculture innovations contributing to self-empowerment and community building.

The interviewees most often spoke about environmental conditions followed by permaculture’s community impact, health, permaculture’s personal impact, food security, permaculture improvement, and living conditions (see Table 1).

**Table 1.** Coding Instances of Life Domains

<b>Life Domains</b>	<b>Number of Coding Instances</b>
<b>Environmental Conditions</b>	35
<b>Permaculture Community Impact</b>	29
<b>Health</b>	27
<b>Permaculture Personal Impact</b>	22
<b>Food Security</b>	18
<b>Improvements due to Permaculture</b>	17
<b>Living Conditions</b>	14

During the data analysis, individual quotes assigned to each life domain category were mapped and organized by prominent themes. These within domain networks pro-

vided additional insight into the specific dimensions of the life categories. The network views for the life domains are available in Appendices B- I. The following analysis will first describe each domain in detail and then identify relevant cross-domain interactions.

## **Environmental Conditions**

The environmental conditions category is comprised of six sub-categories in order of prominence: water issues, changing weather patterns/seasons and climate change, soil condition and contamination, deforestation, and loss of fish and animals. For a network view of data coded to environmental conditions by prominent themes, please see Appendix B.

Water issues dominated the interviews and were mentioned in responses coded to four other domains. The communities where the interviewees lived do not have running water and therefore depend only upon natural water sources for consumption, household use, and agricultural use. El Salvador has pronounced rainy and dry seasons, with almost all of the country's rainfall occurring only in the winter months between May and October, thus making water scarcity a reality for these communities.

Interviewees also spoke about local changes in weather patterns/seasons and climate change. For example:

In the case of water, we have seen for example that we have a river that is very beautiful. It is called the River Torola. From my childhood I remember that I always go to the river and it was a big river and really high and there were fish and the people fished there but now we have a problem



that there aren't any fish anymore . They are gone and anyone can say that is not true but the reality is being lived and on top of that the river has receded and you do not see the river like it was before and that is how we notice things and we think about the principal cause that the water is in a short time receding. And it is the same with the forests; there used to be more forests. When I was studying in fifth grade they would take us up a mountain during the school year but now that mountain is gone because the housing system has increased along with the population and it is soon going to be a housing colony and so we see those changes. And that contributes to the warming within the seasons. Another thing is that there are people that know about the problem but they don't make an effort to plant trees because that is another thing that you see is that the protection has diminished from the forests. I see that a tree that they cut down, they do not plant another and that is something that is very noticeable and when I am in the communities I see that farmers have cut down many trees but they haven't put in even one or two and that is something that people have lost. Before, lots of people planted trees and conserved the native plants and that is why we don't have native medicinal plants from our zone and that is a huge resources loss. (Valentin, Interview 11)

Soil conditions are very poor in these communities due to years of chemical agriculture, the impact of the civil war, and being located in areas of non-arable land:

Well, when I was a little girl, I grew up in the cotton plantations. That was my work and I remember how so many people used to be poisoned by the chemicals that the planes used to spray. I remember that and many of those people are no longer alive. Another thing is that when the cotton harvest finishes, those lands are left totally dead, dead because of all the chemicals that they applied; they were left infertile and then the war began. The bombing started and the big trees that were ancient and so beautiful, the bombs destroyed them. The water sources deteriorated and we still have the effects of the impact to our environment because it seems that no one wants to work on it and stop the effect. And we are letting people move more towards destruction. I can tell you that when I arrived at the community, there were little ponds of water everywhere but when a project came to plant tica (teak trees), they took away all the natural growth trees that grew there and they planted teak. About six years later we have a water problem. Teak absorbs too much water and it doesn't allow it to reach our zone. There used to be a lagoon there that was so established that at night the frogs didn't let the people sleep and now that lagoon is no longer there; it already dried up. The ponds have dried up. We have the problem that people fight amongst themselves for water because now there just isn't enough. There is very little and sometimes we have to have water rationing—one day one family and then in two days another family—like that, because there is very little water. So in all of that we can see what we

have done to ourselves, how harmful it was to cut down the trees and plant trees that were inappropriate to our conditions like eucalyptus and teak. They brought them from other countries to plant them and they convinced the people that in five years the teak was going to bring them money. Everyone got excited about it but what they didn't explain to them was the possible effects that planting could have on the springs. So in that aspect I have seen how the land deteriorates and how every day we become more vulnerable to disasters. (Reina, Interview 9)

Environmental conditions interacted with all of the experience categories. Due to the dependence the subsistence farmers have on nature to survive, the prominence of the topic points to the appropriateness of combining environmental improvement with peacebuilding efforts, particularly in rural communities.

### **Environmental conditions and food security**

For example, this winter it is true that we have had some good rain but there have also been days that it hasn't rained and it seems like there is a disequilibrium and it is not like it was before. Because in May, it used to rain every day, at least a storm that was enough for the crops and for everything that lives. But not now; now it rains less consistently and it rains too hard when it does and then it stops and then a strong wind comes and then a few days later you have another strong storm and that damages the crops because it is either not enough water daily or too much water at

once. So even though this was supposed to be a good winter, we have losses in the harvests. Perhaps the crops have had about 70% production and 30% was lost in some places. In other places, though, it has all been lost because when the corn needed the rain, there wasn't any and when it came the stalks were already dry and the corn was lost. I saw the same thing last year because in January we had such a strong wind like I never experienced in my life and that damaged many of the crops and the people got worried about what they were going to eat. (Renia, Interview 9)

We have a small parcel. We can get our food for our families, which is essential because the population is growing and eventually that will limit the area we have to work. And that is why we have to prepare ourselves for tomorrow and work in that situation. We also work with organic material; we protect things of nature and that is helping the environment. Everyone talks about the environment but they don't do anything to help it but we go to the root of the problem and start working with the soil because that is the foundation. The education of a town is not easy, everyone knows that, but we are working in this situation because if we don't work in this situation, there could be a big, even dangerous, disaster. We also work with people through education that we don't want to get into a famine situation. If we have something to eat, what else would we need to worry about? (Paco, Interview 5)

### **Environmental conditions and health**

Well, one of the things that [permaculture] has done is to help me reflect that permaculture is the path to finding life because if we are going to fight to reduce chemicals and one day remove them completely, it is for that day when we will farm with something that will sustain life to take care the nature, the seasons, to create habitats for the birds. If we continue to use chemicals and what we produce is full of chemicals, we hurt ourselves and we jeopardize our own health and the health of the animals like the birds. (Elesseo, Interview 4)

### **Environmental conditions and permaculture personal impact**

We see that permaculture is a solution that we have as farmers to sustain ourselves and not to have to cut the trees. We are able to understand and realize that the plot that I work, I am able to work it to provide me food for my entire life without the need to cut down more trees. And we can give the earth the food it needs with the green manures and increasing fertility and we won't cut trees because we have realized that conventional agriculture, which has been around all this time, we have seen how it wastes the land. There is erosion and all that which comes from the incorrect use of the agrochemicals. I feel like for us, as agriculturists, it is the best technique, the best alternative that we can use. And it has a lower cost because in these times we know that we have to leave an inheritance to our chil-

dren, this new generation. If we don't lead the charge for that change, we leave them an uncertain world. So we work, even though not everyone here wants to get into it, but we have been making the path so that people can see that yes, it works and it cares for us, a people, and cares for all the earth, our mother earth. I feel like, well, when I went to go to my permaculture design course two years ago, when I was there, I felt like, I got a feeling like I have a lot to do. It is like nature herself calls us to not destroy her more than we already have and that we need to help her recuperate everything that we have taken from her, because we have taken it from her. So it is like a call that she makes to us to change. I feel like with the design course that we went and took, and we still need to learn more and more, because you never stop learning, and being able to teach others to not destroy anymore and to protect the little bit we have left. I feel like permaculture came to El Salvador at the right time and to us, which is a solution that we can't let it go, we have to put it into practice and work with it. (Angelica, Interview 5)

### **Environmental Conditions and Permaculture Community Impact**

I do remember that in my childhood the rivers, going to the rivers was beautiful, it was pretty and the rivers even had cascades and falls that were near my house. There was water falling down them even if it was summer; there was always water. In the winter we were even able to go swimming

there, and now that I want to take my kids to a river, I have to go after the winter and go very far but we always take them to the river but the little waterfalls that used to be around are all gone and that is a change that I have noticed and I tell my kids, look kids we still have this little bit of water right now but I tell them that God willing when you are my age that you can still come here with your kids because you can see a huge reduction in the water. And another thing is that kids need to have the knowledge of that because they are not seeing what I saw but they are seeing less but hopefully when they are adults there will still be something. In my community, we study with children in a program called Blue Rainbow and all of the little children know how to recycle the trash because when the institute was there we were there showing the children and the adults. And there, thank God, the children don't throw trash on the ground and if they eat some snack they take the bag back to their house. In my case I have to be getting those bags out of my kids' pockets but that is good for our community and it would be good to implement more permaculture in the schools and in the churches and the catechisms and it would be good for the kids so that they can start developing consciousness from when they are very small. (Norma, Interview 11)

## **Environmental conditions and permaculture improvement**

The changes that have been described are changes noticed in climate change. When we were younger we had a different environment but that was starting to deteriorate but it was in different conditions than what we see today but at the local level, the efforts I have made on my land that serve as experiments as well, I have seen that since two or three years ago when I bought it, that little piece of land, and I bought it with the intentions of experimenting on it and rehabilitating it and producing food on it, and from when I bought it until now, there has been a lot of change. The soil was sterile, very poor quality, and now that the organic material that falls to the ground from the plants themselves, the fertility is now at a different level. The presence of species and wild animals like spiders, there is a series of little animals that are appearing that you observe are appearing and that is part of the change of life that the area is having. So we notice a lot of changes in areas and development if the person is applying or we apply the permaculture knowledge. (Regino, Interview 11)

## **Living Conditions**

In describing living conditions, interviewees gave descriptions of low income challenges and water scarcity. Interviewees spoke less about their living conditions than I expected. What I observed in visiting the communities was that they were isolated clusters of people living in a small hamlets with the houses set quite apart from each other.



The houses consisted mainly of roofs and side walls with an open floor plan. There was no running water or electricity so the permaculture composting latrines made a significant difference to the living conditions. Most of the interviewees either came back to their home community after fleeing during the war or were resettled in the zone after the conflict. When describing challenges to their permaculture practices, interviewees discussed their lack of income as an obstacle to implementing some portions of their permaculture designs. As subsistence farmers, they had little opportunity to generate income through employment and had limited access to markets to sell surplus products using the traditional economic model. Overall, the interviewees most often spoke of their living conditions in terms of water issues and feel quite impacted by changes that they were observing in their local weather patterns and environment. For a network view of data coded to living conditions by prominent themes, please see Appendix C.

### **Living conditions and water scarcity**

When in other places, not exactly where we are right now, but in other places where we lived before in the department of Cabañas, in the place where we lived there were more than 20 springs of water and now there are only about five in that place. Only the largest ones still have water but they put in pipes and they take the water away and now the people who live there don't have any water. That is a noticeable change. It wasn't a flat region; there were many hillsides with lots of water springs and it was

the best, but now the landscape is changing with the lack of water.  
(Elesseo, Interview 4)

Last year 12, women made family vegetable plots, along with their families. The thing is that here you can only plant in the winter because there is no easy access to water anywhere near here. You have to go really far, so in the summer it is harder to plant vegetables. There are some people here that have cisterns to collect rainwater but not all of the houses have them for their families. (Isabel, Interview 5)

### **Improvements in living conditions were tied to the economic benefits of increased food production**

When people know that they can grow food without having to go far, we also achieve that people get consciousness in the same family that they start improving their living conditions, even in the economic parts we can say. Because it fills me with much satisfaction when I go visiting in the communities where my compañeros are working and I speak with the families and say how do you feel and the people start, some people even cry as they tell their stories and now, they say, now I get to sell three or four dollars worth of tomatoes [average wage is \$2 a day]; before I bought everything and now it becomes a saving for them as well, a family saving.  
(Reina, Interview 9)

## **Living conditions and health**

Previously I worked in the zone of Tecoluca and I worked in La Libertad. We worked with 12 or 13, no, 14 communities. We worked on projects and teaching, making green manures, making insecticides and herbicides, and some stoves that we ended up making with the communities to make the environment better in our homes to avoid our families being exposed to the overuse and burning of charcoal because they are prone to bronchitis so we try to avoid the smoke. (Tomás, Interview 2)

## **Health**

As previously mentioned, the health category emerged during the field interviews. The topic of health and chemicals revolved around concerns over contaminating oneself through farming methods and consuming food grown with agrochemicals (see Appendix D). Several of the interviewees spoke of how people used to live longer and they attributed that longevity to the previous absence of chemicals in agriculture and the subsequent food supply. All of the communities where the interviewees lived are located in isolated rural areas and therefore access to medical services was both difficult and costly.

## **Health and chemical contamination**

Another thing that you notice after years of using the chemicals, the soil doesn't have peace or tranquility and in the end, the soil demands more and more chemicals because the plagues come and come. I think we will

come to a time where the soil will not give anymore because of all the saturation of the chemicals. The ironic thing is that the plagues and insects keep reproducing and change and the chemicals don't kill them; the only thing the chemical is killing is the soil and us humans. You notice with the chemicals that you start getting less and less and you have to spray more and more and the insect has adapted itself to that chemical and then we go to the agro-supply and try to get something more powerful to kill the insect. So they sell you something stronger but the insects don't die and all we do is intoxicate ourselves and you see a change that you are exhausted, exhausted. But now we know how to diversify our milpas to control what insects are going to bother us and which are not. We say, because my neighbors are farmers too, we say that the chemicals have the seeds to eliminate us humans because the poison no longer works and we have to look for something stronger and keep buying more chemicals. In the end, after you apply it, the corn falls over because it is too weak, because the stalk is too weak and in the end the person who loses is always you. You can't pay off a loan that you have at the bank because your harvest wasn't good and all it ended up being was chemical after chemical which gives us very little to eat and what we do get is contaminated. (Maria, Interview 12)

### **Health and consuming chemicals**

Permaculture is also helping us greatly in regards to the healthiness of what we produce. Because many of the sicknesses that are present are due the consumption of chemicals in what one consumes. Unfortunately, this knowledge has come late, but better late than never, because we now are on the path of leaving that and moving towards leaving the future generation a healthier environment (Isabel, Interview 5)

### **Health and living longer**

If we speak about taking care of people, we begin to relate the chemicals because as the chemical use goes down, the health of the person increases, becoming more healthy, and that is healthy and they have a long life like before, when people took care of themselves and they lasted a longtime. (Oscar, Interview 1)

Permaculture is a very wide topic that gives us a lot to talk about with each other and discuss things. It is wide in the sense that if us two practice permaculture, we are also preventing a lot of illnesses in our case because if you look at the life before of humans, they lived much longer. And now we are dying young with worse diseases and we try to explain that to people so that they can develop consciousness. I tell them: so when you plant the land and when you are going to spray the land and you buy a liter of Gramaxone, I ask them, what is the first thing that you see on that bottle

and they say they see the skull and then I say, well what does the skull signify to you, and they say death, and I say, well then what does that tell you? It tells us that we are consuming a percentage of poison daily when we are planting that way. They start to think about that and it goes a long way. (Thelma, Interview 12)

### **Health and food security**

Now with the seed selection training, we can say that we have food that is safer and more healthy because now it isn't bought and what is native doesn't need as much chemicals and it adapts to the climate of the place where it is planted and that is why the seed exchange is happening, but it is difficult at times. Because the insects died during the use of all those chemicals, it is very hard to recuperate them. But even if one pair of insects that survives and those two insects reproduce and they begin to aerate the soil. We can see that the soil isn't as hard. What the chemicals did was they made the soil impermeable and what would happen is that the rain would come and it wouldn't get absorbed because the insects were not there making the little holes to help aerate and let the water soak in but now that we are starting to insects again. The washing of soils of has stopped with the return of the insects and teaching the communities to dig swales and to plant living barriers. This has helped the land a lot to have this change. (Naomi, Interview 10)

### **Health and permaculture improvement**

We are a little newer at working in permaculture, about 3 years, and so last year I started implementing the organic process on the land that I work, and yes, you see a huge difference because the production helped me a little bit last year from the previous years and that helps a lot. But what we implement is modest because we are a small group of people working; it is not like there are a lot of us, but even so, we see changes. Before, I used a lot of chemicals and it was like I would get poisoned very often, almost every year twice a year. I always visited a medical center after I would get poisoned but now I have two years that I haven't gotten sick from chemicals and I try to get rid of all chemicals by growing organically. (Thelma, Interview 12)

### **Health and permaculture personal impact**

For me, the it was seven years ago that I started in permaculture, and the impact that it had on me was the environmental problems and I think that it impacted me deeply as a human being that one says nature has life, even though it is not your own, and in permaculture I have learned about the relationship between us all and that we mutually live. And if we do not do things in a certain way, I felt like everything was going to finish. I think the personal impact for me was being able to contribute to nature and who we really are as people. I depend on a family that is an agricultural family

and that before they didn't consume as much chemicals but then when the transgenic seeds came, that changed the system of life as well. The impact for me was learning how to improve the health of the family. And that impacted me personally to see how I could improve my parcel and there I saw the results of the work and I think that it is working because we have changed in our family and improved our lives. (Valentin, Interview 11)

### **Permaculture Personal Impact**

When speaking about the personal impact that permaculture has had on their individual lives, the interviewees described relationship building and the satisfaction of sharing themselves with others. What is particularly interesting, however, is that interviewees described relationship building both between humans and between humans and mother earth. Mother earth emerged as an *in vivo* code during the data analysis. Interviewees spoke of the earth in terms of a mother earth and this transformed the planet from an external object to an actor in human relations. Interviewees described feeling empowered by gaining permaculture knowledge. Additionally, several of the interviewees expressed experiencing permaculture as a call on their lives, similar to a vocation. Permaculture is not just an agricultural technique used by these interviewees but permaculture is integrated into their life outlook (see Appendix E).



### **Permaculture personal impact and relationship building**

Yes, for me it [permaculture] has had a personal impact. I have met many people from other communities and we have relationships of friendship and of work. We also know the need that mother earth has to be rescued so that we don't lose her because we will lose ourselves. That is what we are learning. (Alejandro, Interview 4)

### **Permaculture's personal impact and the satisfaction of sharing self**

When I did the design course, I realized that, well, that understanding comes to you, when you don't know it before, it comes to in one great bang and then you want to do everything and everything catches your attention and that was the impact it had on me. I wanted to transform everything; even my husband said I was pushing things this way and pushing them that way because when you first start and when you haven't had this information before, you want to change everything and I do it for the communities. When they give me a new community, I get just as excited and I go flying there with excitement. (Norma, Interview 11)

### **Permaculture's personal impact and empowerment**

Well personally, I feel secure because in a crisis situation, I could survive because I have learned a lot through permaculture. And the idea is to

share, transmit this idea to others that yes, you can survive and face this situation. (Oscar, Interview 1)

### **Permaculture's personal impact and life outlook**

People can often speak about the environment but they speak about it as something isolated or separate from them as a person but a description of the environment has much to do with how I relate with the water, the forest, with the soil itself, and so normally in a culture what we learned or what they forced upon us was that the environment was the trees and the little cute birds and it is something romanticized but that I don't have to do anything with it. So for us, community is both the humans and how the humans interact with the community of the earth so that they are a part of the same system. And that I as a person am responsible for my practices. (Regino, Interview 11)

### **Permaculture's personal impact and vocation**

Just after I did the design course, I cried. I cried after I got it because even though this isn't a degree from a university, it is a certificate that is on behalf of God, because I felt closer to God when I was able to understand the harm we did to the land, the harm we did to our families, and instead of enriching the land, we were giving it poison. So I felt like the earth was my mother which I had killed in that moment and that I had a driving need

to resuscitate her and to be able to do something for her. (Reina, Interview 9)

## **Permaculture's Community Impact**

The descriptions of permaculture's impact on communities fell into three main sub-categories: serving as an example, working together, and community success.(see Appendix F). Overall, communities were impacted by the permaculture practices implemented, particularly the water sanitation projects. Interviewees also described the development of a community's eco-knowledge or awareness, ranging from litter collection campaigns to general reforestation efforts that were not directly associated with the permaculture projects. Interviewees described their permaculture practices as being the vehicle to serve their community by example, and it often led to people observing their work and becoming interested in practicing permaculture as well. Interviewees spoke about communities beginning to work together on food and seed exchanges, which increase local food security and community independence. Collaboration was increased within communities between community members themselves and other community organizations. Communities also began working with outside communities as a result of permaculture participation.

### **Permaculture's community impact and development of eco-awareness**

After the war, we see the vegetation has returned and we are protecting and conserving it to have a better climate and adequate. And I think that

permaculture has helped us greatly because we are now entering into education to take care of all of nature because we are all interrelated and interrelated with our mother earth. Everyone is getting to be more conscious of that. And we see that people are now trying to take care of the resources here. Our homes are no longer bare, without trees, but now everyone has trees around their houses to protect us and make it cooler. (Angelica, Interview 5)

I have managed to get people to be conscious about the environment and to have litter cleaning campaigns, to take care and not to chop down trees, and to try not to burn anymore and to stop putting poison in the rivers, and all those things you use to start orienting the communities and the people so that we can try to come out ahead. (Maria, Interview 12)

### **Permaculture's community impact and serving as example to community**

For me, like I said, when you start you want to do everything but sometimes you can't due to economic reasons but for me that is a challenge because in my community we are only two compañeros that are working with the institute and it has been a challenge for us because the people are watching us, and even more so, because the institute was formed there and now we are part of the institute and so they know we are permaculturists and they keep watching and saying to themselves, what is this person doing, what are they doing that is permaculture? And so for us, it is a chal-

lenge to work in what we can and in my crops, I planted in the part where we designed, I planted, I did a guild planting there, and it is near the edge of the path where people pass and when I was putting down the fertilizer they were observing what I had put down. I made a mixture of plant, ashes, and insect droppings and people were skeptical and commenting on that, saying with that thing, nothing will grow, they told me. But you should see the ears of corn. In fact the milpa never got its color but it gave beautiful ears of corn. When I was making an insecticide, I made one of onion and garlic and people were saying that is not going to kill anything and I explained that was the point, we do not want to kill but repel the insects that hurt the crops. The permaculture work is a personal challenge, but in addition to the fact that you have to go out and explain and you have to teach and you have to find the way that the person will accept it, that they accept the work and they realize and change their way of thinking, so you have that challenge and you have the challenge of implementing your own land because we are being watched by everyone else and they see in us that, yes, the permaculture works as we implement it and we can begin to change their thinking with the practices that we do as permaculturists.

(Norma, Interview 11)

### **Permaculture's community impact and working together**

Once we were settled here, we participated in soil conversation projects but it was before the lands were distributed and so the land was being used communally, all of it. We would do the projects in groups and on one occasion we constructed about 1,400 meters of rock barriers but in different parts of the lands and they are still there, but afterwards, some of them were in some lands and some were in another but the idea when we made them was to make them together and whoever ended up with them on their land, that was fine. (Elesseo, Interview 4)

### **Permaculture's community impact and working together**

Sometimes going out to the countryside, you see how the people have their different styles of work, styles of sharing with their people, and you say how good that is. It is the best part. I had heard that before they used to interchange food in communities, like if someone didn't have beans, they would exchange beans with the person who had corn and I would think how was that possible? Before, I imagined people doing that, but I didn't believe it, but now I see it with my own eyes and I say, well yes, it is possible and how beautiful it is because you see how the people are living together and to see that harmony and friendship and love, and that they protect each other and that if someone only had corn and another only beans, it would be illogical that the one with the beans would be there just

with all those beans and not to share them. Permaculture even does that; people share. If I have green onions planted in my vegetable garden, you can give me a tomato and I can give you a bunch of onions and that is very beautiful way to live and that very much motivates my work. I think that is something unique to permaculture because people growing just organic or using conventional methods don't have that same interchange. That is what is good about permaculture, because is it wide and large, and people have the liberty to think and to do what their hearts tell them to do. (Reina, Interview 9)

### **Permaculture's community impact and working together for community independence**

We have to talk about how the plot is medium for connection within the community of a block. Maybe I only have enough room to plant two species because I only have a few feet of concrete on my porch but my neighbor, on their same size of concrete, could plant two other types of species and between the two of us, we have four species. So we if talk about a block, we could have twenty species for the community and the community can self-provide through self-production and exchange without the need for money between them. You can exchange one tomato for one chayote or loroco or green beans and you make your food basket based solely on exchange. That is our idea: to strengthen the community through plot production. It requires organization as well because it isn't about

everyone growing tomatoes. It is a medium of integration, reflection, and communication between people. (Miguel, Interview 13)

### **Permaculture's community impact and working across groups in community**

Coming here to work in permaculture has expanded our work from working primarily with women to now also working with male farmers, because we are also working with male farmers, and there is a group of them that are also implementing organic practices and we also show them what we have learned here about living barriers and dead barriers, and they start implementing and that had expanded the impact beyond the women and to work with the male farmers as well. (Maria, Interview 12)

### **Permaculture's community impact and increased collaboration**

We have tried to coordinate with different committees and other organizations that are located within our municipality and in our communities. In our case, we have worked with the board of directors and even though it has been difficult, that has not been an obstacle for us but we in fact have broken those barriers and challenges. (Thelma, Interview 12)

## **Food Security**

Local experiences of food security clustered into two main categories: food independence and food diversification (see Appendix G). Interviewees often spoke of the



benefit of having food immediately available in the vegetable plots. Applying the permaculture technique of dense planting not only increases the amount of food available but also increases the diversity of food, which improves nutrition standards within families. Prior to having bio-intensive vegetable plots, the typical diet for rural subsistence farmers consisted of corn tortillas and beans. Vegetable plots provide vital nutrients required to balance out the farmers' diets. Food security is defined as having uninterrupted access to nutritionally dense food and permaculture is helping to achieve food security for the farmers that practice it.

#### **Food security and immediacy of food**

Yes, it [vegetable plot] is the source for our family when the plot is in harvest time. Every time they want to cook, they just come out to the plot and pick what is needed. It is not necessary to go far; in the moment you need it, you go out your door and you have it and it is so satisfying. (Alejandro, Interview 4)

#### **Food security and increased availability**

I also have tomatoes, chiles, green beans, and more, and it is beautiful when my daughter says to me that she wants a soup of chipilin (wild leafy greens) and green beans and she goes outside to cut them. I have some pictures of her so happy cutting green beans, right at home. It is such a blessing. Before, it was not that way. I had to buy everything. It was like I

didn't have it in my mind that I also could produce food in my home and to eat healthier. (Reina, Interview 9)

### **Food security and diversification of crops**

Another thing that I have seen improve is the diversification of crops. Because before all the farmers only planted corn and beans and didn't attention in planting pipians (green squash) to make it diversified in the same plot so as to have everything and that is something that works in your favor because they no longer think that if I plant beans in the area, I can't plant anything else because it won't grow. Now with permaculture, we have seen an improvement and you can see that planting items together works and the plants support each other. This has been a big change because people would plant large plots of corn and nothing else that could help them. With permaculture, you take advantage of every inch of soil. (Isabel, Interview 5)

### **Food security and diversification and food availability**

I very much liked the vegetable plots and when the plant them, the varieties we plant, and we diversify the plots, it is very important because the soil gets bored with one single crop and it also helps us keep the insects the away from disturbing the crops. When there is a diversity in the crops, the insects go away because I have a plot that we did in the "u" style and I have planted in containers. At times when you plant in containers, it is

very important because the insects and little animals don't come to the containers as much, and the soil, because you put it there, it doesn't have many sicknesses; also because the soil that you put in there has a higher organic content but you have to make sure that water is not missing in containers so that the plants can bloom. I have tried all of that and it doesn't matter the quality of the soil that is there, but if we practice composting, that is the most important, because it is the compost that strengthens the soil. In our house, there is everything. We do not buy lemons or pineapples or yucca, so we don't buy a lot of food. (Naomi, Interview 10)

### **Permaculture Improvement**

All permaculture work is based on improving the soil conditions, and when the interviewees spoke about permaculture improvement in their communities, they spoke of soil improvements, water improvement, and ecological improvement (see Appendix H). The soil conservation techniques are generating noticeable changes in the communities. Water issues are the main environmental and living condition concerns for these communities, and permaculture addresses these concerns locally through the minimal technology of filtration and rain catchment cisterns. Permaculture aims to mimic nature's own systems and the interviewees were observing the reemergence of animal biodiversity in the areas where they are practicing.

### **Permaculture improvement and soil conditions**

We are also working with communities here in the mountain range, and they have had major changes. We have helped the farmers restore parts of their natural forests, improve soil fertility, improve the humidity in the soil with natural ground coverings. (Miguel, Interview 3)

### **Permaculture improvement and water conditions**

They did an analysis of the water that we consume and this water came out with metals in it from the war. It also came out with high fecal levels because we have a problem because the canton is inhabited up top and so everything ends up here in the bottom zone where we are, and the water carries all of that as it makes its way here and is more contaminated by the time it gets here. So they said it had those high levels, and so then with the help of the IPES institution, they helped us with the water test and things have gotten better, thank God. They helped us; they helped us with some composting latrines and that helps the water contamination. And we have eliminated fertilizers, not completely, but almost, and we are also doing soil conservation on the high part where we don't have a lot. We also need to keep working on converting pit latrines into composting latrines because that helps improve things more every day. And the knowledge of the composting latrines that we have helps us avoid contamination and as it begins to compost fully, we use it to improve soil fertility, so that is a pro-

cess to process it in another composter after it has initially composted and then we use it to help the fertility of the soil because we mix it with other organic matter and that is how we get the fertility to increase. So that works as a way to combat the destruction from the war. And now in the new test they did, because they did two tests, it came out that the water is cleaner even for human consumption, but that doesn't mean that we are going to stop working to improve it; we want to keep working it on it to make it even better and not let it deteriorate. Also, people feel healthier because they are consuming fewer chemicals and healthier food. And speaking of water, we now filter water. With the help of our compañeros, we have built a sealed tank and we also made a natural filter so that the water stays cleaner. So we have knowledge of the permaculture's water practices, both in theory and in practice here. (Carmen, Interview 7)

### **Permaculture improvement and ecological improvement**

So now my parcel is much better because I am not cultivating 100% of my land because I am trying let the soil regain her biodiversity and to observe how nature is so divine that it helps the soil rejuvenate itself. I am pleased with my plot because before, when you looked at it, all you saw were some posts; there weren't any birds; there was nothing because I liked to have everything really cleared and not to have shade or anything, but now that I am with the institute, my fences have trees and tropical birds. It is

beautiful because when I go in the evening, I like to take my little girl and hear all the birds that are there eating and they are flying and fighting and now the birds leave the crop alone, which is good to see, to contemplate and see how one convinces oneself of the reality of what we speak about in the theory of permaculture. You prove to yourself that it is reality and that if the animals have something to eat, they will leave the crops alone. It also feels very good to live together with and share with the animals; that is a big motivation for me. Before, when I raked the land, I didn't find worms. This year after a storm, I raked the ground and I found some huge worms. I was very happy to find them. I was happy that my land had what it really needed and that also motivates me to keep giving other people advice so that they can start trying it. (Reina, Interview 9)

The interviewees did indeed discuss permaculture's impact on multiple dimensions of their lives. The application of permaculture and the effects it had were not limited to purely agricultural descriptions. Environmental issues dominated their experiences, as well as water issues. When speaking about one dimension, interviewees often spoke also of other dimensions, showing an interrelatedness among their own lives and permaculture's role in all aspects relevant to their daily living (see Appendix Ia)

Permaculture, as defined by co-originator David Holmgren, is a systems-thinking approach to agriculture that leads to the creation of a sustainable culture, including the application of permaculture principles to human organization (2007). The interviews recorded during this research document a transition from permaculture innovations

addressing local environmental conditions to permaculture innovations contributing to self-empowerment and community building. Lederach (1997) states that “peacebuilding must be rooted in and responsive to the experiential and subjective realities shaping people’s perspectives and needs” (p. 24). The co-occurrence between the research seven life categories shows that permaculture does indeed address the experienced realities and basic needs of the rural poor and therefore can be framed as a peacebuilding activity (see Appendix Ib).

Additionally, permaculture practice as described in the interviews can also be viewed as a conflict transformation activity by using Lederach’s (1997) framework. Lederach describes conflict transformation as a descriptive and prescriptive change that occurs across four dimensions: personal, relational, structural, and cultural (p .82). The *personal dimension* refers to changes in the emotional, perceptual, and spiritual aspects of the individual, and prescriptively, transformation represents interventions that minimize the destructive effects of social conflict and maximize the potential for personal growth at physical, emotional, and spiritual levels. Permaculture literally provides for physical growth first by making food more accessible, and second by producing food that is safer for consumption. Water sanitation and rain catchment provide potable water for these isolated communities, which is vital for their long-term health. Permaculture impacted the interviewees’ emotional lives in many ways. Some interviewees described feeling immense satisfaction at doing their work, while others felt empowered by their permaculture knowledge and no longer felt as vulnerable to natural disaster. Several interviewees

described permaculture as a spiritual practice or a call on their lives, and often spoke of God and/or Mother Earth when reflecting on their work.

Lederach's (1997) *relational dimension* refers to changes in relationships, and prescriptively, transformation represents interventions that minimize poor communication and maximize mutual understanding with a goal to promoting interdependence (p. 82). Relationship building was an important theme in both the permaculture personal impact and permaculture community impact categories. The interviewees discussed building relationships with other permaculturists, with other community members, and some even described relationship building within families. As previously noted, relationship building was not limited to a human-only experience, for the majority of the interviewees spoke about their relationship to the earth or Mother Earth.

The *structural dimension* of conflict transformation works to address the underlying causes of the original conflict and to bring about changes in social structures. Prescriptively, it fosters structures that meet basic human needs and maximizes the participation of people in decisions that affect them (Lederach, 1997, p. 83). Permaculture as practiced in El Salvador provides for basic humans needs through an integrated approach. These rural farmers are very much on their own, with little support from the government for basic services and virtually no agricultural or environmental management support. By empowering people to address their issues locally, permaculture addresses the root causes of structural rural marginalization while providing an organizational structure that can be used to engage local governments, as in the case of the interviewees that are working with their municipality's board of directors (Thelma, Interview 12).



The final dimension in Lederach's (1997) conflict transformation framework is the *cultural dimension*, which works to address changes in the cultural patterns of a group, and prescriptively, works to build mechanisms to respond constructively to conflict. Interviewees were able to handle challenges to their permaculture work more holistically mainly because permaculture, by definition, seeks to find solutions to problems. One of the permaculture design principles is "the problem is the solution" and helps support a problem-solving outlook towards conflict. Permaculture and challenges/conflict will be discussed in detail in the following chapter. For Lederach, conflict transformation is an integral part of the peacebuilding process and by applying Lederach's (1997) conflict transformation framework, permaculture can be framed as a conflict transformation activity as well as a peacebuilding process.

## **Chapter 5: What Are the Challenges in Implementing Permaculture?**

No single peacebuilding technique serves as a panacea for all that is wrong in the world, and permaculture as practiced in El Salvador faces its own challenges and conflicts. Understanding these challenges is critical to the development of permaculture as a peacebuilding framework. Challenges shed light into intervening variables in peacebuilding processes, and the ways in which permaculture practitioners address these conflicts serves as a litmus test to the power of permaculture as a peacebuilding tool. The second guiding research question was aimed at determining what were the main challenges to implementing permaculture and how did permaculture practitioner handle those challenges. The types of challenges and conflicts documented in the interviews fell into three broad categories: challenges over economic resources, challenges in convincing others to participate, and various types of social conflict.

The first type of challenge described in the interviews was over economic resources. Economic resources limit the implementation of full permaculture designs and technologies. Water sanitation, rain catchment, and irrigation systems require modest investments of approximately 500 US dollars, but this is a significant amount for these practitioners. Even if material resources can be secured, the water works are quite labor-intensive and meals need to be provided to volunteers who come to help build them. The

Permaculture Institute of El Salvador was able to implement water works in several of the communities through grant funding, but since that grant has expired, any water works projects must be funded by the communities themselves. However, the water works projects that were facilitated by IPES serve as teaching models for other communities.

But we do not have the economic resources to take the communities everything they need. For example, I tell them that we have given them a head start and we have given them meetings on how to organize themselves and to create their projects so that they can take that to other NGOs who can help them. And that has come out from here at IPES and we have helped them learn how to organize themselves and get what they need. For example, there are things that the communities can do from the first day and there are things that need other resources, like the cisterns. Many people would like to have a cistern but a cistern costs almost \$500 dollars in materials; that is how much it costs with materials and the labor and we require that the owner of cistern provide food for the people who are working to build it as well, because food is expensive, and with all the time that you are going to spend here building and the people have to get there to help because one person alone cannot do it, there have to be several people to be doing the excavations and working the material and leveling it until it is finished. We also need more money for the stoves, and the stoves, even though they take less money, if there aren't resources, if it is only a little bit, you need money to buy the cement and materials to

make the chimney above it. And now that IPES has helped the communities with the material for those projects. Even scissors cost money and the trowels and tools to build them because you can't do anything without the tools. Those are resources that are always used. People often say that they would like the water to be filtered because it is very important, but it does cost money because you need cement and sand and sponges and lots of things and iron to make the lids and also you need the brick to make the sides. But IPES facilitated these projects to teach people how to do it and they had to do it because there were some people that were drinking water from the brooks that were so dirty and this helped the health of the people because the brooks were so dirty and now the water passes through and is filtered for the communities. And these are not costs that are thrown away; they help the people to produce and the communities are left with the knowledge. And now the communities themselves are technicians because they learned how to make those things with their own hands. (Noemi, Interview 10)

The economic resource shortage is also felt on the personal level, with several interviewees expressing the desire to implement more permaculture technologies but being temporarily limited by a lack of personal funds. However, when speaking about personal financial challenges, interviewees incorporated the permaculture principles of *using local resources* and *small and slow solutions to problems* as responses to these challenges:

When we were studying the design course, we started on my plot and I drew the design and then my dream was to transform my land and if someone can't implement it all due to economic reasons, you can always start to implement permaculture practices on your land even if you can't do them all at once and *remembering that we look for local resources and everything that is local is considered and incorporated.* (Norma, Interview 11)

This year I was going to make a cistern but unfortunately I couldn't do it due to economic reasons but I have the knowledge about cisterns for when the water is being rationed, I will have my own water and not suffer. I have a house that I believe in a few months will fill a cistern which will last through the entire summer. At least I have the knowledge of the alternatives. What I don't have are the resources at the moment to make it but I can start making it little by little *because permaculture teaches us to make changes little by little*, but in the end, I will have a cistern because I am convinced that it is the alternative for the water situation so I am trying to build my cistern and, Lord willing, I will build it. And that will also serve as an example for others to get the idea to do it too. (Reina, Interview, 9)

The incorporation of permaculture principles during discussions of challenges in the interviewees' lives indicates that the permaculture nature observation skills essential to successful permaculture practice are being translated into a social observation skill. In

essence, the tool to observe natural systems is being transformed into a tool to observe human systems, including conflict systems.

The second challenge that the permaculture promoters face when working the communities is the difficulty in getting people to believe enough in permaculture methods to implement them. Convincing others of permaculture's benefits is often hard when they first enter the communities. The biggest challenge the promoters face is the fact that conventional agriculture practices are easier than the labor-intensive permaculture practices. Any proposed methodology that challenges conventional agriculture will be viewed with skepticism, but an approach that requires more manual labor is often quickly dismissed. The benefits of organic and permaculture agriculture are numerous but are not readily apparent during an explanation to a prospective farmer. Most subsistence farmers work alone and the prospect of doubling or tripling the amount of manual labor to achieve a crop is not appealing. Interviewees remarked that it was very difficult to speak to people that have only ever seen conventional agriculture. Several described the ease of conventional agriculture as a habit.

Another difficulty that we have is that it is hard to bring out consciousness in people. For them it is easier to put the sprayer backpack on and spray and fumigate the land and do in one day what will take me a week to do by hand. So it is more convenient for them to use chemicals and that is why I say it is hard to get people to start working in permaculture because it does mean more work. You have to work more but you get the best. You get something good for you. It is hard to make people aware of the need to

change our agricultural practices because conventional agriculture is now the way people are used to working. Permaculture requires more work because now I have to find the cattle waste and chicken droppings, and I have to do this and that, and people say, no, I just will spray because it is faster and that is something that is very difficult to bring about consciousness around. (Maria, Interview 12)

All of the interviewees stressed the importance of their permaculture practice being the main vehicle for attracting initially skeptical people to permaculture. The mantra of “live by example” is embodied every day. In fact, Miguel from Interview 3 was an ardent skeptic about permaculture when he first learned about the work being done in his community and it was through seeing the impressive results a year later that he realized that permaculture was addressing local agricultural problems. He slowly began attending meetings, attending volunteer work days, and incorporating what he learned on his own land. He is now one of the main promoters at IPES, and his permaculture knowledge and organizing skills are invaluable to the institute. By focusing on the permaculture practices, the promoters allow the space for skeptics to observe their technologies and see the results of the work first hand. Norma spoke about how her neighbors, who were constantly criticizing what they were observing her do on her land, eventually asked her for seeds because they saw how abundant her crop was. She seized this opportunity to teach her neighbors seed selection skills and the neighbors are now working small sections of their plots using permaculture techniques.

A third challenge is that some of the communities have visiting agronomists who work for other NGOs or the government, and those technicians only support conventional agriculture. Since the agronomists have official titles, farmers will often value the agronomists' knowledge above that of the promoters.

My zone is a bit challenging in getting permaculture off the ground because it is a zone that is invaded with many projects that are based on chemicals, and they deliver chemical aid packages to people, and the agricultural engineers that they send to the zone only work using chemicals and if you talk to them about organic agriculture, they are not convinced. They start putting up obstacles to your work. The people believe them because they are the engineers, so they do things the way that the engineer says because it seems like it is easier and there are faster results. (Reina, Interview 9)

Other NGOs working in the community create additional challenges, as Reina described, by bringing and often providing chemical agriculture aid packages to the community, or bringing aid projects that undermine the permaculture work (e.g., teak tree projects that dried up the water table or flush toilets that consumed scarce water).

At times, promoters found it was easier to involve older community members because they still have memories of their parents and grandparents working in traditional ways. The concept of returning to traditional ways can pose a challenge in a society where consumerism is being advocated as part of the neoliberal economic agenda.

Permaculture is about self-sufficiency and self-reliance and it is about enriching what you have. That is a revolutionary concept in this society be-



cause in this society, what is here in El Salvador is not what is valued; what is valued is everything that is outside. What is valued is the culture of the States or Europe and things that are produced locally don't have value. Things that are imported are the things that people want to have.

The traditional way of here isn't valued. What people are wanting to have is an urban way of life where they have a car and cable television. The idea that what we had traditionally here for generations is the most valuable thing is complete weird. What do you mean, indigenous and Indian and old and the times before? Just saying those words to people gives them a concept they are not attracted to. There is no romanticism about going back to the past, none. (Karen, Interview 6)

Not only is there no romantic notion of going back to the past, but Karen hits upon another challenge to permaculture in the Salvadoran context—the discourse of indigenous identity in El Salvador and permaculture's roots in local indigenous agricultural practices. Although a discussion of indigenous identity and permaculture is beyond the scope of this dissertation, it should be recognized that indigenous identity is complex in Salvadoran culture and for the most part has been denied as even existing in El Salvador after the 1932 *Mantanza* massacre. In Salvadoran culture, indigenous often is equated with poor and marginalized individuals and the indigenous identity may be rejected by rural dwellers who do not want to be associated with the negative indigenous connotations. (For a comprehensive study of indigenous history in discourse in El Salvador, see Tilley, 2005).

Although it is essential to recognize the challenge that indigenous identity can have in contexts like El Salvador, the permaculture practitioners did not speak of indigenous identification in a negative context during the interviews. In fact, connection to the agricultural past became an emergent code during the analysis and included references to a Maya past. It went beyond the scope of my research to explore whether permaculture practice helped to build peace with indigenous identification, or if the practitioners who spoke about the Maya did not have previous negative connotations with indigenous identity. This is an area that is ripe for future research. From the interviews, the practitioners who spoke of permaculture as a connection to their past often spoke about reclaiming traditional knowledges that have almost been lost, and they spoke from a position of empowerment through permaculture to claim these knowledges. Juan Rojas, the principal founder of IPES, has designed an indigenous permaculture design course that uses the Mayan calendar as the basis for the permaculture principles and he now works primarily with self-identified indigenous groups actively incorporating Mayan spirituality into permaculture practice.

One of the beautiful things that permaculture has is that it teaches the person to look for solutions to the problems. That is one of the things that I think David Holmgren and Bill Mollison got right, one really important thing, and that is acknowledgement of the cultures. Our origins are in the Maya and there is a lot of wisdom that has to do with the spirituality in regard to mother earth. (Regino, Interview 11)

In the third lesson, we talk about how the moon influences the plants. There is an entire history and practice to working with the moon and the most important aspect is the movement of the liquids in the plants. And that change isn't only in the plants but also in us humans and the animals, and so we are going to give the people that knowledge so that they can work together with that force of nature, and so that they can look for the best dates to plant certain plants. There are better moons to plant lettuce and other moons are better for radishes or onions. These are ancient Mayan knowledges; our grandparents planted with the moon and there still are people that plant with the moon. We haven't lost that knowledge completely yet and you hear of the older people still being able to work with the moon and they know the lunar calendar very well. We are reclaiming that knowledge. (Ricardo, Interview 13)

In addition to implementation challenges, permaculture practitioners also faced formal conflict during their work. The types of conflict experienced centered on community conflict, family and gender conflict, organizational conflict, land tenure conflict, and environmental activism conflict. Any organization or individual that works with groups of people is bound to experience some form of conflict and the permaculture promoters were no exception. Broader community conflicts impacted the work they were doing in a variety of ways. Miguel's (Interview 3) home community was experiencing a rise in conflict due to the parceling of land that was a previous part of the cooperative where he

lived. He felt that the process of dividing the cooperative lands into individual parcels was weakening the once strong community organization structure.

Parceling of cooperative lands often leads to community conflict in El Salvador, and the IPES has witnessed the disintegration of cooperative communities once parceling begins and people sell off their individual plots to outsiders, or a single family begins to dominate the cooperative by having their extended family buy any plots that become available. When individuals sell their plots, they are not obligated to sell the land to a person that shares the same values as the larger cooperative, and conflicts often arise when new owners do not share the same orientation to agriculture as the rest of the cooperative. In one cooperative in particular, conflict ensued when the new owners did not practice organic agriculture when the cooperative was an organic coffee farming cooperative with international organic product certification that could have been jeopardized by any use of chemicals on the cooperative.

Communities also had conflicts with their local government institutions. Local government in El Salvador often functions within a patriarchal paradigm and individuals do not question the decisions of the elected local leaders. However, IPES encourages collective decision-making and collective engagement with local power structures that can lead to conflict when leaders who are not used to being held accountable to local populations begin to feel threatened by their decisions being questioned. Many rural communities have a government-supported community development office that goes by the acronym ADESCO. The ADESCO has a board of directors and an elected president, and those roles are often filled by local political and business leaders. ADESCOs are set

up for collective decision-making and the board of directors and president are to carry out the decisions made by the community collective. Many people in the communities did not know the process or structure that ADESCOs are supposed to use and therefore they did not participate in the system. IPES held local trainings to explain the ADESCO laws and obligations, pointing out that it was the collective who made the decisions, not the board of directors. The communities began to engage in the ADESCO processes and sometimes that created initial conflict with the ADESCO leaders. There were several instances in which the communities did not choose to elect the same president because that person was not responsive to their needs. The conflicts with local power structures did not occur in every community and IPES worked in partnership with many of the ADESCOs that had more progressive leadership and wanted to support the work of the institute.

There were also conflicts during early stages of working with communities when promoters began to invite marginalized people to the trainings. Sometimes these would be members of the oppositional political party, because towns in El Salvador tend to be dominated by one political party. In other instances these would be members from different religious orientations, such as evangelicals who were invited to participate in predominately Catholic areas. Initially there was tension at the trainings but once the group moved into implementing their designs the groups worked collaboratively

People also had problems working together when family dynamics would enter into the larger community work. Most of these rural communities are small and a handful of families dominate the population. When a family dispute arises almost everyone get involved in some form. Miguel (Interview 3) had an incident where a family problem had

taken place the day prior to a volunteer work day and he noticed the tension when he arrived to work, with but no one was speaking about it directly. However, when they stopped for a lunch break, everyone was supposed to take their work tools with them; one person accused another person of taking his tools and the conflict quickly escalated and machete knives were drawn. It was a dramatic and intense moment for Miguel, who had to intervene in the situation to calm the parties down. Another community experienced a similar rift when lines were drawn during inter-family feuds that had nothing to do with resources or the work that IPES was doing there, but revolved around an allegation of abuse of one family member against a member of a different family. The communal conflict ran so deep that the permaculture work nearly came to a halt, but IPES kept coming to the community and focusing on the permaculture work and eventually the momentum to learn about permaculture returned.

Gender conflict also became more prominent during the permaculture work, particularly in the formative years of IPES. IPES was founded by a group of male farmers, and when Karen came to work with IPES, she conducted an evaluation of the projects and their local impacts. During Karen's evaluations, local women expressed an interest in learning about permaculture as well, and they were interested in learning about home vegetable plots. So Karen created a home vegetable plot program that was geared toward the women to help increase their participation, but this separate women's group created conflict amongst the men, who had never experienced a women-only group. They were suspicious of the group and began to complain about it. Not anticipating this reaction from the men, Karen opened up the women's group and decided it was best for IPES not

to work in separate gender groups as it aggravated gender relations. Once the meetings were no longer separate, men began to attend the activities, first as observers, and then as participants, and eventually the formal women's group went out of existence. The initial women's group did serve to increase women's participation in permaculture during the formative years of the institute. Responding to this initial gender conflict actually built the foundation for families to participate in permaculture training together, and husbands and wives came to trainings as teams, often rotating attendance at the meeting during the planting or harvesting seasons.

Women's participation became so prominent in the communities that many of the women became leaders in the organization by becoming permaculture promoters. This caused a different kind of gender conflict. Karen was the director of the Institute and Reina was the permaculture promoter with the largest number of communities under her responsibility. At times, male promoters admitted that it was difficult to take orders from a woman and that they struggled with it because they did not want to feel that way, and that they were learning about themselves through the dynamics of working in a female-heavy organization. Even though women around the world are now the main population of subsistence farmers, some men in rural communities still see agricultural work as men's work and so having a large percentage of staff being female, and women being in charge of organization, has challenged attitudes. I did not observe any difference in treatment of the women promoters by their male counterparts and I would have not picked up on the underlying gender theme had Karen not discussed it in her interview as

a conflict challenge she has faced. The fact that the promoters can discuss these gender issues openly shows the strength of the organization to confront conflict.

IPES also experienced its fair share of organizational conflict through the years. The most notable organizational conflict took place when IPES received substantial external funding for their work, which provided the opportunity for the organization to expand but it expanded much too quickly for a young organization. The funding provided the opportunity to carry out the water sanitation works but it required an extensive amount of planning due to the amount of material inputs and labor needed to complete the projects. The organization, which was very horizontal, felt it needed to incorporate vertical decision-making layers in order to handle the logistics and documentation of the multiple projects. An outside project coordinator was brought in and access to the director was funneled through a new administration level. The promoters in the field that were accustomed to a horizontal organization felt very distanced from the director, to whom they had previously had access, and problems began to emerge. IPES experienced the pains of quick expansion and new staff that did not have the same dedication to permaculture practice as the promoters. The promoters felt that the project coordinator was not fulfilling his job responsibilities, but had no outlet to express that to the director because of the new administrative layer in the organization that they viewed as a wall that was set up to keep them away from the director. Eventually, the conflict came to a head when the project coordinator could no longer keep up with the demands of the position and decided to walk off the project and the organization was able to use the opportunity to reevaluate the new organizational structure. This was the first time that the director was able to hear



how the promoters felt about the new administrative staff. IPES re-organized itself and dissolved the administrator level. The organization survived the expansion and successfully helped several communities gain access to potable water and rehabilitate their soils. Soil rehabilitation, however, led to another type of intervening conflict—land tenure.

Land tenure has a long and turbulent history in El Salvador as noted in the literature review. In various waves of agrarian reform, people did get access to land but many never received legal recognition from the land registry and legally do not have rights over the territory. Land tenure issues need particular consideration in postconflict contexts, since tenure is often unresolved for several years and can create a variety of conflicts that swallow up the permaculture work.

In the lottery project, we started off with one project with 25 families when we starting working with them. By the time the project ended, there were only eight families that lived in the community because the land issue had never been resolved. the conditions were impossible to live in anyway, so people just left. There are communities on that coast about which I know in particular that the bank has taken over ownership and people have lost their land. So that aspect of land tenure is an issue. When land tenure is not resolved, the communities are undermined. The other issue, where communities are renting land rather than owning it, or individual families are renting from whoever owns the land, it makes it much more difficult to practice because if you are doing physical things on the land, like swales and soil conservation measures, the landowner might not

like it or the landowner might like it but you're only going to have that parcel for a year or two, and you just invested for something that won't be yours, and it is much more difficult to get people to do soil conservation when they don't own the land. In fact, it is almost impossible to get them to do soil conservation. Soil conservation is a big investment measure and if it is not your land, why would you do it?

Some people, their landowners have ended up being really supportive because it actually improves their land. Land tenure issues aren't our forte so we encourage people to go to people we know that might be able to help them. One of the communities we worked with in La Libertad had actually settled themselves in a national park in a protected area, so with that community, we did a lot of negotiating and we had meetings with the owners of the national park, the government body, to convince them that we were trying to support the community to live within the national park in a harmonious way, but in the end, little by little, people left and there is only a handful of people there now. (Karen, Interview 6)

The final type of conflict that promoters face is community environmental conflict. Reina (Interview 9) was currently involved in a community environmental conflict where a group of people had decided to squat on land that belonged to the cooperative and they were attempting to build houses there. The group of people had the backing of a local organization and local builder, but they did not have the right to the land that they were claiming. Reina was fighting to protect the land since it has the last remaining forest in

the community. The piece of land sat on a hill above the community and so the impact of building houses there would be dramatic. By removing the forest, the natural wind break would be gone and the crops would be exposed to harsh winds that easily damage crops. The trees contributed to the water supply and Reina firmly believed if they cut down those trees, the little water that the cooperative had would vanish. She is was to preserve the forest because she knew how vital the forest is to the water supply.

However, not everyone in the community was in agreement in conserving the forest. The builders and supporting organization come to the community and tried to convince the cooperative members to let them start building. In Reina's words,

But I keep telling myself that I have to do something to save that forest; I have to do something and I hope I achieve it. It is very difficult here; it is not easy to struggle when you have knowledge about something and the majority of people do not and they are only thinking about their own benefit and not about the damage that they are going to do to our mother earth and their neighbors. And it is still dangerous here to speak out; it is a matter of life at times. (Reina, Interview 9)

It is no exaggeration that speaking out for the environment in El Salvador can be a matter of life or death. Two months prior to this field work, Marcelo Rivera, a local environmental and social activist, was murdered in a death-squad style kidnapping and brutal murder. Marcelo Rivera was the leader of the local anti-mining campaign that has become quite contested in the Department of Cabañas. The mining company is aggressively trying to gather support for the project from the community, but Marcelo Rivera was an

outspoken activist against the project that would bring serious environmental consequences to this small zone. It has been reported that the Canadian Pacific Rim mining company, who consequently is suing the government of El Salvador for mining rights under CAFTA through a United States subsidiary, would show pictures of Marcelo to unemployed mine workers who worked on the preliminary mining exploration and tell them that the reason they did not have money to feed their children was because of the man in the picture—Marcelo Rivera. Marcelo was “disappeared”—a term from the death-squad era during the civil war—on June 18th, 2009, and his body was found 12 days later at the bottom of a 75-foot well. As reported by journalist Dominique Jerry-Shore (2009), his naked body had no hair or fingernails, his trachea had been broken, and the thumb of his right hand was placed in his mouth and tied into place. He had been brutally beaten and his face was beyond recognition. Two other anti-mining activists have been assassinated, including a local priest, and three radio announcers in the area have also received death threats for their vocal stance on the case. In the film *Return to El Salvador* (2009), Deysi Cheyne, the executive director of the Women’s Institute for Research, Training, and Development, is quoted as saying:

It is very difficult for us to accept that the death squads still exist, just like during the military dictatorships, but the fact is it is true. They are killing social leaders; they’re killing leftists, people who are protesting the mine, the dams. Those are the people who are turning up dead. So the question becomes, “Who’s doing that? Who is killing these people?”

Marcelo Rivera is considered the first environmental activist to be disappeared and later murdered for defending the environment, according to Dr. Salvador Menendez Leal, the adjunct ombudsman for Defense of Human Rights in El Salvador (*Return to El Salvador*, 2009). So Reina's words about that danger of speaking out for the environment are very true. Environmental peacebuilding, like all postconflict peacebuilding, requires a safe social space, free from the fear of violence or retaliation. Fighting to keep local waterways clear from the toxins used during the mining process can mean life or death in postconflict contexts. The environmental peacebuilding literature traditionally has focused on the environment as a cooperation tool and the environmental scarcity literature has focused on isolating scarcity levels that serve as triggers for violent conflict at intra-state and regional levels, but Marcelo Rivera lost his life under very different circumstances. The case of Marcelo Rivera highlights the importance of developing an environmental peacebuilding framework that addresses various forms of social conflict, including social activism.

## **Chapter 6: How Does the Postconflict Context Impact the Practice of Permaculture?**

The challenges and conflicts that the permaculture practitioners and IPES documented in the interviews are the types of challenges and conflicts that face most individuals and organizations doing sustainable agriculture work. There are, however, specific challenges that arise when implementing permaculture in postconflict zones, and the following section of the data analysis will explore those situations.

The war experience creates unique challenges to practicing permaculture in both the immediate postconflict phase and the long-term peacebuilding work. In El Salvador, rural communities in the conflict zone were often forced to flee their original communities. The majority of the interviewees had fled their communities during the war. About half of the interviewees returned to their original communities and the other half were resettled in different communities.

When new communities are made up of persons from various regions of the country, they do not have knowledge of the local agricultural conditions, nor do they know the way that weather patterns impact the new lands where they are living. Permaculture works best through a direct knowledge of the land gained through long-term observation, but when you are working with refugees and resettled communities, that history of the land is not available. Permaculture practices can be applied to any plot of land immedi-

ately, but other permaculture practices are greatly enhanced by knowledge of the land. For example, soil conservation methods can be implemented working with the topography's contour, but knowing how the sun moves across a particular section of land is very helpful when designing bio-dense vegetable plots. Although there are various green insecticides recipes that work in a variety of conditions, knowing the specific insects that predominate in a zone allows the practitioner to plant specific types of plants with the crops to help repel damaging pests. As resettled communities gain familiarity with their land and learn to observe the land through a permaculture lens, they will gain the ability to implement permaculture innovations that address their local conditions. Additionally, the permaculture nature observation process may serve as a mechanism to help individuals identify with their new lands.

Reintegration of ex-combatants is a prominent theme in the postconflict literature, and many peacebuilding programs focus exclusively on this complicated activity. According to Jeong, "To become part of a community and not revert to their military past, former combatants need to be fully integrated...[I]f they are not properly integrated, many former soldiers are a potential threat to security and social stability in their resorting to banditry in El Salvador" (2005, p. 143). However, the ex-combatant categorization is not homogenous and a variety of ex-combatants exist based on the different types of conflict in which they participated. In El Salvador, the recognized armed conflict took place between the military and paramilitary powers of El Salvador and the FMLN guerilla army. The Salvadoran countryside was predominately supportive of the FMLN during the war and continues to identify with that political party. The heart of the guerilla army was

made of *campesinos* (rural peasants) and most *campesinos* either took up arms directly or supported the guerilla army who fought for agrarian and social justice. Many of the *campesino* guerilla combatants that came from subsistence farming communities returned to agricultural life when the war was over. When IPES was formed, a significant majority of the permaculture promoters, if not all, were ex-combatants. Although IPES never framed itself as a combatant integration program, it did perform functions of a program that reintegrated combatants. The ex-combatants received environmental and leadership training and learned skills to help them earn a sustainable livelihood. Employment training is a hallmark of combatant integration programs and, in the Salvadoran context, teaching subsistence farmers how to maximize their agricultural production, which is their only source of income, equates to employment training. In the Salvadoran context, where the combatants had agriculture backgrounds and one of the root causes of the conflict was land rights, permaculture can provide secondary reintegration benefits but caution should be used in applying permaculture with the primary aim of reintegrating ex-combatants, particularly under different conflict contexts. Since this research was conducted almost 18 years after the cease-fire, the reintegration effects of permaculture were not expressly captured in the interviews, other than that two interviewees spoke about their previous work after the war in helping reintegrate ex-combatants. Perhaps a link could be drawn between those two persons' previous reintegration work and their current involvement in permaculture, but it was not the focus of this research. It is, however, an area ripe for exploration, particularly in the light of permaculture's contribution to developing sustainable livelihoods.



When war creates environmental damage as it did in El Salvador, soil and water conditions need a high level of rehabilitation. Levels of contamination need to be assessed whenever possible prior to starting any practices that involve food production. Although not applied in the Salvadoran context, within permaculture there are techniques that can address contamination issues. Three main techniques are bioremediation, phytoremediation, and mycoremediation. Bioremediation uses microorganisms, bacteria, and enzymes, while phytoremediation uses specific plants and is particularly useful in removing heavy metals from the ground. Mycoremediation uses fungi mycelia and wood degrading fungi, and is particularly effective in removing chlorinated compounds such as pesticides from the soil.

In the immediate postconflict timeframe, caution must be used until lands are declared safe for agricultural work, since artifacts of the armed conflict can remain. Land mines, unexploded bombs or grenade. The immediate danger of performing soil work in former combat zones, although serious, is to be expected. What I did not expect to hear during my research was this danger still being felt nearly 18 years later:

In one of the communities to which people are still migrating, in the sierra of Guazapa, where we work there are still artifacts of war and one little girl died and another survived but was left severely injured. During the war the bombs made huge craters and then they would just bury people in those holes, but now with time, it's covered up more and now people try to live there and work the land and sometimes the heavy rains uncover something. The children, the two girls, found a grenade, a heavy-grade artillery

grenade, and they knocked out the pin and the one died and the other was left injured for life. Those are things and situations that arise from war and in this time as permaculturists, we say we are working in a new way for a new time, but those things bring back memories and a new death for the old reasons. (Miguel, Interview 3)

Unexploded weapons pose a physical risk but for some, working with the soil poses an emotional risk which is particularly important for the practice of permaculture in postconflict zones

Artifacts of war are not the only challenge to implementing permaculture in a former war zone. Miguel (Interview 3) describes how people's war memories can be triggered by permaculture work:

We have had some difficulties mostly with the projects that have to do with water sanitation because they require more economic inputs to meet the requirements. For example, I was working on water cisterns that would bring water from high up in the faraway mountains for a community but in the end the results weren't what we expected. I wanted 100% success and it wasn't at 100% and those are challenges that I face and I want to get more training to learn how to beat those challenges. I think with the communities we are very successful, maybe not 100% but 70-80% successful, which is a great advance for those communities. In regard to soil conservation, how do I say it, people still have scars of the war, because when we get to the communities, we tell them that the foundation of permacul-

ture is care of the earth. but to care for the earth, you have to apply various soil conservation measures. You make living barriers, leave forest, and to dig swales for irrigation. In fact, there was a community that didn't want to work with us; like 50 to 60% of the community didn't want to because when we started digging swales, there were many people who said that we were starting to dig trenches again for another war and those are the things, for me, that are a challenge

How do we convince people with that mindset that we have taken care of the soil and water so that the ground can hold more moisture but those people didn't want to participate because it brought back memories of the war for them. It with happens with a lot of people. Even yesterday, when I was on the tour with the new communities, there was a man there that said that the swales reminded him of the trenches that we used to dig and those are the kind of things that bring the war back really quickly to people, and many people won't dig them because maybe their loved ones died there, and digging and moving the land to make swales disrupts things even though it is a good work for agriculture and the soil conservation measures that we promote. (Miguel, Interview 3)

I personally witnessed the complexity of soil conversation in a postconflict zone when I was touring Carmen's land (Interview 7). Upon arriving at Carmen's land, I was greeted with a sign, with skull and crossbones, which read "Stop, Danger, Mines." I decided not to walk further and luckily Carmen came out to greet me and told me it was fine to walk

there and that the mines had all been cleared. I continued down the path and came to the porch of her home, where she had a few chairs set up for the interview, and when I sat down, I noticed that artillery shells, parts of bombs, and other weapon artifacts were lined on the edge of the veranda wall. When she saw me looking at them, she explained to me that these were all found on her land, along with some land mines. It was, in reality, the first time that I really felt the physical presence of the war during my interviews. After our interview, we went to tour her land. We walked down to the water spring she had described in the interview and she pointed out a variety of permaculture practices she had implemented on her land.

On the way back from the spring, she took me to see her *milpa* (corn plot) because she had planted it on a contour—a famous permaculture technique for soil conservation. The planting was impressive, and as I walked through the field, I noticed something out of the corner of my eye. It looked like a couple of medium-sized rocks that were painted bright blue and they were in the middle of a row of corn. When I turned to look at it more closely, Carmen told me that those rocks were where the army murdered her uncle during an operation that swept through the community and during which very few people escaped with their lives. She said that those rocks were where the parts of his body were found and so he was buried there. She said that she plants around the stones and she thinks that her uncle would like being under the corn and giving life to a crop each year. Then we kept walking and she showed me her seed drying set-up, and the tour continued as if having a gravesite in your cornfield was completely normal. Carmen has obviously come to terms with her uncle's death and his burial site being in her field, but

for others, these types of situations can be painful and, much like Miguel (Interview 3) describes, can cause them to avoid digging around in areas where the dead may lie.

In three out of the four communities that I visited, the interviewees either mentioned that a massacre had taken place there or I later read about some massacre taking place. Each of the four communities suffered heavy bombing which claimed the lives of many civilians who were unfortunate enough to be out in the open during a bomb strike. Bomb craters and bomb shelters/dugouts still exist and, with the overgrowth over the years, are nearly impossible to see and pose a risk when walking through areas where regrowth has taken place. Permaculture has much to offer in the postconflict context but it must be applied in sync with the local conditions after war. Peace builders who are using permaculture must remain sensitive to complexities of implementing permaculture technology in former war zones. As evidenced in Miguel's interview, as long as people have the memory and experience of a war, there is a possibility that permaculture practices may need modification to suit the healing processes of individuals and communities.

Because it is rooted in local agricultural conditions, permaculture is not always an external concept that is introduced during postconflict reconstruction and peacebuilding, but local war experiences can also be the start of relationships with nature that support permaculture practices. The best example of a war experience leading to permaculture practice comes from Paco (Interview 5). He spoke openly about his experiences during the war. Palo Grande was subjected to heavy bombing during the war. Charles Clements provides a detailed account of the conditions suffered by the Palo Grande community during the war, in his memoir *Witness to War* (1984). Dr. Clements went to El Salvador

to provide medical care to injured noncombatants in the Guazapa region. His memoir documents the indiscriminate bombing of the region and the use of white phosphorous and napalm against the civilian populations. A massacre took place in Palo Grande and upon entering the community's boundary, there is a small memorial to those who died, many of whom were children. Paco began this part of his interview by answering a question regarding changes in the environment. First, he spoke about the reforestation of Palo Grande and how now it is heavily forested again and then he went on to speak about 12 water sources that disappeared during the war.

And now we want to rescue and conserve the waterholes that we do have.

And also in this area, whatever tree here that does not give fruit is used for medicine. That is the way it is; every tree has its utility and that needs to be conserved. I have a plot where I plant medicinal plants because during the conflict they closed all the ways in and out, in that time, and there was nothing for anyone, no pill for anyone who was sick that was here in this zone. We had to implement an artisan laboratory where we had 225 botanical recipes. With those recipes, we, because I was in the area of health and I worked with the doctors, we labored to make that laboratory. We made all kinds of pills; for example, here people suffered from malaria and all those things and we even made pills for malaria and we made stuff for people who were anemic from lack of nutrition. Most people had anemia. We made all of that. That is why I have a great respect for and appre-

appreciate the vegetation because from there we got life and everything we needed.

It was a terrible time. During the war, this was a very difficult zone. Only in this sector, which is Suchitoto, there were thousands of people in the population. There was a huge population, hundreds of children in that war situation. They said to me, because I worked a little bit with the Red Cross I had some basic skills, they said to me that I was going to work with health. We would train the girls to handle minor emergencies and then we had six popular clinics. There was one here and the rest were in the bottom zone and I had to check the clinics to see how they prepared things. I had to prepare the workers to work in that situation by taking them the materials they needed in the laboratory and I also watched over the injured. In each clinic in the lower zone, you can talk to someone down there that was working in the clinics, there was between 200 to 400 consultations practically every day. The situation was very difficult. The whole population was in tatters, the children were barefoot, a total devastation. Maybe you have seen something like it in a movie. It was such a critical and challenging time for the population. So I worked during that time and that is what motivates me to work now, to be a voice to that situation, and that is why I keep some of those plants. They served us for something and they can work for us again should we need them.

So that was about 1982. Perhaps that it was my first taste of permaculture....All of us as humans have gifts and we have wisdom but we have to look to where we are going to implement that wisdom and where we can work to expand that wisdom. Some people waste their wisdom and use it to hurt someone, steal, and do all those disastrous things, but I admire my fellow companions that are going into the path of using their wisdom to help through permaculture. Creating places and sharing our education gives people the opportunity to have their own moment to find their wisdom. I think it is part of the human condition because, as I repeat, I went through that entire war and I stayed in that area because in reality I saw my fellow humans suffering. When they gave me the areas of the hospitals and there were at least 40 injured people, not minor injuries but amputated, without arms and all of that, and my satisfaction was to be there with them to help and support them and be with them at night and to give them the attention they needed and to tend to them with the resources that we had. Because we know that all of us have feelings; we feel and when we see something like that, it shatters us and we try to see what we can do. So I admire the work that these two (Angelica and Isabel) and the work of others that accompany me in the permaculture work because they are trying to help. (Paco, Interview 5)



## **Permaculture and the peace accords: a missed opportunity**

When the Chapultepec Peace Accords were signed in 1992, the accords contained a land distribution program that transferred land to FMLN combatants, FMLN supporters, and wounded Salvadoran military personnel. Although the plan was fraught with delays, it was eventually implemented to the satisfaction of the international community. The plan did fall short on the number of people that it benefitted. The Peace-Accord Mandated Land Transfer Program (PTT) did not, however, specify the conditions or the location of the lands that were to be distributed and did not include a provision of technical assistance to PTT beneficiaries, and for some, the end result was that the letter of the accord was met but not the spirit of social reconstruction and benefit for land recipients. “The example of El Salvador indicated that in the absence of agricultural credit and technical assistance, land transfer programs leave small landowners worse off than before” (Jeong, 2005, p.147–148). Maria describes the PTT experience in her interview:

In Tecoluca, the majority of people, well, it was one of the municipalities that was most impacted by the war because the war that we lived here in El Salvador in Tecoluca, there were a lot of campesinos that were massacred. There were many massacres there and now, of the people who have come back to Tecoluca, the majority, about 90%, are people who were combatants for the guerillas and so the municipality was repopulated with people who were up in the mountains. This type of people are people who have been very organized; they are people who are fighters, strugglers, hard workers. They essentially joined the guerillas because there really

wasn't another option. If they stayed in their houses, they only stayed to be killed by the army.

After the fighting stopped, they came out of the mountains with nothing; literally, without even a blanket, nothing. And many people obviously had lost their loved ones and even to this day, there are mothers that are still looking for their children, women whose husbands were killed and their children were killed. So the changes that we have seen is that these people who came out of the mountains came with the desire to work, to remake their lives again, to conquer and work the land and even though they got land, nothing changed because today—well, that was part of the peace accords that the people would be given land—that they would get their portion of land but it was like nothing changed because they gave them land far away, like in Bajo Lempa, which is the zone that floods, and every year those people lose their crops because of the water. In essence, the lands they gave were not appropriate lands to give. Those poor people; they gave them land but it wasn't the best land for them. Perhaps the government did that because they had to take it out of their pockets or they were just fulfilling their obligation and nothing more. They gave the land but they were not the appropriate lands and so the people there are working that land but it doesn't matter because they end up with nothing because they didn't create the conditions for them to succeed.

Imagine if these people would have gotten some teaching in permaculture, but no! They have turned us into a consumerist society, not a productive country, and so that is why the people in the end, they had to sell their lands in order to survive and so what can those people do to farm then? They have to rent the land to farm and sometimes the only land to rent is land on the volcano. And some people that they gave the land to, they gave it to them extremely far away because one of the difficulties for people who got land is not utilizing them because they live in one place and the lands are in another place and the lands are super super hard to get to and in isolated places. (Maria, Interview 12)

Since the majority of lands that the government used for redistribution were former plantations, many of the lands were already sterile from years of cotton production when the beneficiary received them. The Bajo Lempa area that Maria described is located on the natural flood plain of the Lempa River and therefore is not appropriate for subsistence farming and the river has significant levels of pollution, including unsafe levels of lead, mercury, and arsenic. Lands outside the Bajo Lempa are located on slopes of mountains and volcanoes and create extremely challenging farming conditions that further degrade the environment, making communities more vulnerable to loss of soil fertility, river silting, and mudslides. I experienced the challenges first-hand that farming on the side of a volcano poses when I went to tour Oscar's land after our interview (Interview 1). When he invited me to tour his land and observe the various permaculture practices he was implementing on the land, he asked me if I was comfortable walking about six kilom-

eters. I told him that I would be delighted to see his land, never suspecting that the six kilometers were practically vertical. I set off beside Oscar at a brisk pace and enjoying all of the scenery—babbling brooks, swarms of exotic butterflies, breathtaking clouds—and then Oscar said we had reached the turn for his land and what I saw took my breath away in the form of a gasp, because I saw was a narrow trail with an ominous incline. By the time my mind started calculating if I would even be able to get onto the trail, since the start of it was above my head and I would have to grab onto some rocks and pull myself up, Oscar was halfway up the trail and waving for me to join him. I took a deep breath and convinced myself that this hill would be the only one. It was not. I was right to call it a hill, in my mind, because after I got to the top of it, the highest peak of the Guazapa volcano stood before me and apparently we were going up part of it. Perhaps Oscar did not want to discourage me by telling me that we were going to climb within 5 kilometers of the peak, which lies at 4178 feet above sea level, but more likely he was just used to literally climbing to the top of mountain to farm every day. Needless to say it took us some time, with my having to stop and catch my breath, and after an hour I began asking how much further because I was sure we had already climbed 6 kilometers. The trail was incredibly slippery because it had rained heavily the night before, and at one point, when I lost my footing on a slippery incline, I looked down at my hiking boots and then I looked up and saw the sole of Oscar's thin sneaker forging the way ahead of me. I was amazed at how he was able to move at that speed in what looked like slip-on Ked sneakers, while I was sliding all over the place in my hiking boots with their trail-tested traction soles. To be fair, I am sure the fits of laughter we were having slowed us down as

much as my lack of climbing prowess, and an hour and half later we arrived at his land. It was one of the most spectacular views I have ever seen. You could see for miles and the world was awash in tropical blues and vibrant greens.

Oscar showed me his milpa, the companion plants he had integrated, and the soil conservation techniques he had applied. I asked him if he planted the entire plot himself and he told me that he farms entirely by himself and it takes him two weeks to plant the entire crop by hand. He told me that he goes up to his land at least twice a day, but most days he goes three or four times, since he has to carry everything manually that he needs to work with. The only time he has help is during the harvest, when he rents a donkey to carry the harvest down to his home. While I was standing in the center of the corn field, overshadowed by the large stalks, I became incredibly humbled by the vastness of nature I was observing. The climb to see Oscar's land will remain in my memory forever as a once-in-a-lifetime experience, but this treasured memory also serves as a reminder of the sheer struggle and hard labor that Oscar and millions like him across the globe go through to eat.

Oscar's land was beautiful and lush because of the permaculture practices he has implemented, but on the way up, I observed parcels of abandoned, scrub-covered dry land. When he returned to his community after the war, he did not come back to rich, fertile soils. The area had been heavily bombed and burned. He rehabilitated the land through permaculture and it serves as an example of how a knowledge of permaculture can dramatically improve the life of subsistence farmers in postconflict zones.

Maria (Interview 12) said it best when she stated, “They gave the land but they were not the appropriate lands and so the people there are working that land but it doesn’t matter because they end up with nothing because they didn’t create the conditions for them to succeed. Imagine if these people would have gotten some teaching in permaculture, but no!” The government did not provide technical assistance to the land beneficiaries, but imagine for a moment that they decided to provide assistance and one of the forms of assistance they chose to provide was permaculture. There was an opportunity to provide assistance to these individuals who were afforded special status under the peace accords, because of the devastation that they suffered during the war, in a manner that helped restore damaged environments and provided skills to develop agriculture, even in lands not suited for agriculture, using a model that develops sustainable livelihoods and contributes to community building at the same time. It was a missed opportunity due to the lack of knowledge on how permaculture functions in postconflict societies, but that gap has been filled through this dissertation. Permaculture and other environmental restoration techniques can be combined with other forms or stages of peacebuilding to create a more integrated approach to postconflict environmental peacebuilding.

## Chapter 7: Emergent Interview Themes

During the data analysis, three themes beyond the focused inquiry on practitioners' multi-dimensional permaculture experiences emerged. These themes are particularly useful to the theoretical development of permaculture as peacebuilding and include references to permaculture's providing a connection to an agricultural past, unity and organization defining community, and earth as mother earth.

Many of the interviewees discussed how the permaculture reminded them of the way that their parents or grandparents used to work the land. They shared memories of their family members employing various techniques that are used in permaculture, such as green manures and preparing the land for planting by hand, using the traditional *cuma* (curved machete). According to some of the interviewees, this memory of previous family members working in permaculture-like ways helped the promoters engage with prospective participants who were drawn into learning more about permaculture through their own memory of their previous family members. Noemi spoke about her memory of working with her parents in the traditional way:

I used to work with my father when I was little and I never saw my father use those fertilizers that we have now. It was different before and now that I am in this phase of working using permaculture, I can say we had gotten

to a time that if there wasn't a chemical used, the soil didn't produce, but now we are going back to a time in the past and because of that it was an impact for me to learn all of these things. Permaculture impacted me a lot because I remembered the times before. I always worked with my parents since I was 8 years old, so when IPES mentioned permaculture to me and described how we were going to do it, I had already practiced it as a child but the problem was I didn't know where to start to go back to that, but I already knew it. Some people get the design certificate but they have never worked in that way, but someone who has already worked that way before, you begin to remember all of that from the past. So it had a big impact on me and I enjoy practicing and teaching permaculture. (Noemi, Interview 10)

This agricultural connection with the past supports the appropriateness of permaculture as a peacebuilding tool that is locally and culturally grounded. The concepts of permaculture are not foreign First-World NGO-driven technologies, but rather the techniques are part of the agricultural history of subsistence farming, particularly in the Salvadoran context. Many interviewees described rescuing their ancestral knowledge through permaculture. As previously discussed, in a country like El Salvador where there is a historical indigenous identity conflict, permaculture serves as a way to positively empower marginalized voices and knowledges.

We try to emphasize that organic agriculture does not look to be a substitute for the current model because organic agriculture exists and has ex-



isted for thousands of years before the invention of industrialized agriculture. So we don't have anything we have to be substituting. We do not have to be functioning as an alternative to a model that is actually very recent, that is really less than a century old, when organic agriculture has been practiced for about 10,000 years when communities first managed to invent agriculture and sedentary communities formed. It is a practice of millenniums with a knowledge based on the interpretation of natural phenomena that has come through as an inheritance between generations and generations, which was pushed aside or cut off for a new model—the model that is now in crisis. The industrial and economic model is precisely in crisis as a result of not incorporating those factors, those ancient knowledges. (Miguel, Interview 13)

The connection to an agricultural past is not limited to ancient knowledges or memories of previous family members, but the connection also applies to actual agricultural memories. During the Palo Grande interview, Angelica spoke about the loss of an agricultural legacy in her community as a result of the war.

Also something from before the war is that the farmers from here supplied all of Suchitoto. Here they used to grow onions, chilies, tomatoes, cabbages, but all of those people that planted those crops, there are only a few now. There are only three that plant cabbages and onions and so those farmers from before the war already died. There are so many things, so many crops, that we lost in the war and we have to recover them because

this soil is excellent for planting; we only need to give it the appropriate treatment and give it the fertility that it needs to produce those crops and be revitalized. Another thing that we used to grow a lot of was the banana, and women from all the way at the top used to go all the way down to Suchitoto with the big baskets full of bananas to sell them because there were more than the community could eat. That is something we need to go back to, to take back, and see how we can become even more diversified in the crops and it is an opportunity to implement some permaculture practices in our lands. And I feel like we have to recover this because that is what Palo Grande was like before—a rich community that took its harvests to sell. They were the ones that supplied Suchitoto with food and we have lost all that. And that is what we are working for, to revive the culture that was lost because we have lost it and lost the diversification because they didn't only have cabbages, onions, and tomatoes; they had milpa, sesame, rice, and that is something that we can plant here to survive, to survive whatever crisis may come. So I think that is something we need to work on so we can grow everything that we need so we do not need to depend on food from outside but have plenty of food here. Before, Suchitoto depended on this community for food. (Angelica, Interview 5)

Angelica's story of the loss of an agricultural legacy due to the war highlights the extent to which agricultural communities are impacted by war and how they can lose their agricultural heritage as a result of armed conflict. Typically, literature regarding conflict

and agriculture focuses on the physical impacts of war on natural resources. The loss of agricultural heritage due to war brings a unique contribution to the conflict and agriculture literature. Permaculture can work as peacebuilding tool to help address this type of agricultural identity loss and help restore the literal *agriculture* to war-impacted communities.

In the effort to assess whether permaculture impacted multiple dimensions of the permaculture practitioners' lives, the interview schedule contained a question to assess what the word *community* signified to the interviewees. The interviewees' responses clustered into three groups: community as unity, community as organization participation, and community with nature. To the interviewees, unity through organization and participation is core to any concept of community. Several interviewees pointed out the word itself is based upon the words *common* and *unity*. The interviewees also included their relationships with nature as part of their community. Regino described community as such: "For us, community is both humans and how humans interact with the community of earth which is part of the same system" (Interview 11). Reina described community similarly: "Another thing about permaculture that is very beautiful is that I have been able to see how permaculture unites, unites human beings. It creates a relationship between human beings and nature" (Interview 9). The inclusion of nature as part of community was an unexpected expansion of the definition that most likely flows from the permaculture design ethics: care of earth, care of people, share the surplus, and which leads to the final and most important emergent theme from the interviews: earth as mother.

The mother earth theme was an *in vivo* code that emerged from the interviewees' use of the actual words *mother earth*. During the field interviews, I had casually noticed the use of the term but I did not immediately recognize it as a distinct theme until the data preparation and analysis phase began. I clearly noticed the term when I began translating the interview from Spanish to English, and I realized that interviewees spoke about the earth as mother and therefore often used the term *her* when they were referring to nature or the earth. Interviewees described the earth as a mother that feeds and protects them and almost every time they used the term *mother earth*, they actually said *our mother earth*.

So we work, even though not everyone here wants to get into it, but we have to be making the path so that people can see that yes, permaculture works and cares for us a people and care of all the earth, our mother earth. I feel like, well when I went to go to my permaculture design course two years ago, when I was there, I felt like, I got a feeling like I have a lot to do. It is like the nature herself calls us to not destroy her more than we already have and that we need to help her recuperate everything that we have taken from her, because we have taken it from her. (Angelica, Interview 5)

Just after I did the design course, I cried...because I felt closer to God when I was able to understand the harm we did to the land, the harm we did to our families, and instead of enriching the land we were giving it poison. So I felt like the earth was my mother that I had killed in that mo-

ment, and that I had a driving need to resuscitate her and to be able to do something for her. (Reina, Interview 9)

Other interviewees used female-centered metaphors when speaking about the earth as well:

Speaking of the change, what happened was the chemicals came to ruin the land even further after the war and even more so with the bombs. They killed fish and all the animals in the river and on the land; all were contaminated with bombs and the destruction that took place. And then the agrochemicals came to destroy the soil even more and shortly thereafter the soil became sterilized and it stopped producing; if there wasn't the chemical fertilizer, it stopped producing. It was like a woman, once they sterilize her, nothing is left of her to produce and if they don't give her injections she can't produce. Our mother earth is the same. (Noemi, Interview 10)

This personalization of the earth and subsequent relationship-building through permaculture is a significant addition to the environmental peacebuilding literature. Permaculture is a unique environmental peacebuilding tool because it is a tool based upon engagement with nature and the environment. This type of engagement is currently missing from the environmental peacebuilding theories and frameworks. The earth is an active participant and an active recipient of the transformation and peacebuilding activities. A dual relationship is formed between humans and their environment and among humans themselves through permaculture, which creates an entirely new dimension to the term

environmental peacebuilding. Permaculture expands the definition of community to include the community of nature's living systems and transforms human relationships to their environment into relationships of engagement and communication through observation of nature. In essence, this is true environmental peacebuilding—building relationships between humans and nature that work to restore damaged environments and support mutually beneficial relationships for all of earth's inhabitants.

## **Chapter 8: What I Learned from the Interviews**

The previous analyses into the multi-dimensional impacts of permaculture, permaculture challenges, and permaculture practice in conflict zones were based upon the coded data of 22 interviews. The interviewees provided rich descriptions of permaculture in the Salvadoran postconflict context and I used the voice of the permaculture practitioners in order to have their experiences reflected within the data analysis.

Their voices, however, are presented in fragments that serve to move the data analysis along rather than provide a holistic picture of any individual person. In the end, I am the only person who experienced the interviews in their entirety. My own experience of this data allows me to see the overall picture described by the interviewees in a way that is not conveyed in the preceding data analysis. Even though the interview questions came from a single interview schedule, interviewees focused on different aspects of the questions. Each person conveyed a view of permaculture that was unique to their experiences.

The grounded theory approach to research requires the researcher to reflect upon the data as it is collected and during the analysis through a processes called memoing. After each interview, I would write a memo about how that particular interview informed my guiding research questions. During the data analysis process I would write memos

reflecting upon what I was learning from experiencing, coding, and analyzing the interviews and how the interviews contributed to the overall understanding of permaculture.

The following section will present interview maps for each of the 22 interviewees and a short summary of “what I learned” from each person and the implications of that learning for the development of permaculture as peacebuilding. The interview maps located in the appendices reflect the data codes applied throughout the entire interview and provides a visual overview of what each person discussed during their interview.

### **Interview 1, Oscar (Appendix J)**

Oscar spoke at length about the personal impact permaculture has had on his life and that in turn, motivates him to continue practicing permaculture and training others to implement permaculture practices. Oscar was not involved in community leadership or organization prior to his involvement with permaculture and he stated that when he decided to take the permaculture training he did so with a vision that he would share that information with his neighbors and fellow farmers.

The first time I saw Oscar during my visit to the IPES demonstration site prior to conducting the interviews. The first day I went to the demonstration site, a permaculture introduction and tour was being held for communities that were interested in learning more about permaculture. Oscar facilitated several parts of the permaculture introduction and appeared to be comfortable in a training role. So when I interviewed Oscar a few days later, I was surprised to learn that he had only been involved in permaculture work for approximately two years and that he did not have prior community leadership experi-



ence. Through this interview, I learned about capacity building and leadership training aspects of permaculture training. Lederach's (1997) leadership pyramid model analyzes the different levels of actors that contribute to peacebuilding activities. Lederach classifies actors as either top-level, mid-level, and grassroots leaders based upon their circle of influence. According to Lederach, all three types of leaders need to be involved in the development and implementation of peacebuilding activities. In Oscar's case, the personal impact of permaculture on his life included a capacity building dimension which led him to become a grassroots leader. The development of local capacity for grassroots leadership is important in a postconflict context and further research into the role of permaculture in capacity building is needed.

### **Interview 2, Tomas (Appendix K)**

Tomas is the lead permaculture practitioner at the IPES demonstration site and he has significant training responsibilities during permaculture information sessions and tours. His interview reflects his role as the lead designer and his various references to permaculture challenges deal with the issue in implementing the demonstration site plan. He spoke a lot about permaculture training and sharing permaculture knowledge. What I learned about permaculture from Tomas came out during his discussion of the impact of permaculture on his personal life. He stated permaculture has been a form of education in his life and it has taught him to respect people and the natural world, to listen and acknowledge what people are saying, and to value the different contributions individuals bring to permaculture work. Tomas' experience raises questions about whether there is something

specific about the way permaculture is taught that builds this type of skill set or if there is an implicit conflict resolution orientation nested into permaculture model.

### **Interview 3, Miguel (Appendix L)**

Miguel's has extensive permaculture training and his interview reflects a prominent application of the permaculture design ethics and principles and discussions of teaching permaculture during the interview. Miguel's main contributions to the development of the framing of permaculture as peacebuilding were his discussions of the challenges permaculture promoters face when working with communities experiencing local conflict and practicing permaculture in a former war zone. Miguel stated that he did not have any real training in dealing with community conflicts and that it would be helpful if permaculture training included more training on how to handle those situations. Miguel's description of the difficulties of practicing permaculture in former war zones has been discussed at length in the data analysis. However, the discussion of war memories impacting a community's willingness to implement soil conservation measures almost 18 years later is incredibly important for developing an understanding of the role conflict has on peoples' relationship with nature and the long-term effects of war memories.

### **Interview 4, Elesseo (Appendix M)**

Elesseo is one of the older interviewees and he was able to speak about environmental changes over time. He was the first interviewee to share his direct war experience with me. The interview data coded to the "war and violence" category holds particular interest for the field of conflict analysis and resolution. During his discussion of the war, Elesseo

explained the region where we were was a former combat zone and it was very dangerous to even attempt to go out into the open during the height of the conflict. He went on to describe how the community organized themselves and declared their town a war-free zone and how they set up white flags along the perimeter of the community to indicate their neutrality and to indicate the town was to be respected as a civilian population. According to Elesseo, the community kept the flags posted until the peace accords were signed. This is an example of the development of a zone of peace during an armed conflict. Later in the interview when Elesseo was discussing the importance of organization in developing a community he provided another interesting example of exercising community sovereignty. He said that in the weeks prior to the presidential election, the community noticed an alarming military presence in the immediate area. The community decided to send a group of people from the community to speak to the military and to reassert the boundaries of their community. According to Elesseo, the military withdrew its presence from the region within a few days.

Permaculture does not happen in a vacuum and this community's history of organization facilitates the spread of permaculture practice within the community. When designing peacebuilding activities, an analysis of a community's previous organization activities is important in order to design activities that compliment the community's organizational capacity and traditions.

#### **Interview 4, Alejandro (Appendix N)**

It was during the joint interview between Elesseo and Alejandro that “connection to agricultural past” theme first emerged. Alejandro is approximately fifty years old and he shared memories of seeing his father work the land without using chemicals. He also discussed observing a variety of changes in the environment from when he was a child until now. Alejandro also spoke at length about his permaculture practice; he was the only interviewee that described sharing food from his permaculture food garden with his neighbors. When I asked the interviewees how they viewed their work in terms of the design ethics, most described sharing the surplus as sharing the knowledge of permaculture with others rather than describing sharing excess food products. Alejandro had a variety of fruit trees in his vegetable plot which I did not see in other plots that I toured. Alejandro’s ability to share his surplus may relate to the specific diversification of his plots.

The permaculture design ethics do not specify the ways in which the ethics operate specifically and the ethics are conceptually broad enough to cover both literal surplus product sharing and knowledge based sharing. The lack of rigid definition around the expressions of permaculture ethics reminds me of the diversity of satisfiers in Basic Human Needs theory.

#### **Interview 5, Angelica (Appendix O)**

Angelica spoke at length about permaculture’s impact on her community and I began to notice the “mother earth” theme during her interview mostly through her use of personal

pronouns when referring to the environment or nature. Angelica's main contribution to framing permaculture as peacebuilding is her description of her community's loss of an *agri-culture* due to the war. The impacts of conflict on culture are well documented and cultural differences can serve as root causes to a variety of conflicts but until this interview, I had never thought about agriculture as culture. The cultural inheritance of Palo Grande was dramatically changed by the war. Many of the traditional farmers from Palo Grande were either killed during the conflict or never returned after fleeing the area during the conflict. This loss of culture can be reclaimed through the practice of permaculture and Angelica sees permaculture as a way to bring Palo Grande back to its former status of a prosperous agriculturally diversified community. This is one of the clearest examples of permaculture fulfilling a peacebuilding role in postconflict contexts.

#### **Interview 5, Isabel (Appendix P)**

Isabel's interview revolved around discussions of permaculture practice and how those practices improve health. It was during this interview that I began to recognize health seemed to be a separate topic to living conditions. Isabel was also the first person to very clearly correct my use of the word "project" when speaking about permaculture. She told me that they do not use the term project and that permaculture is an educational tool and a way of living. I had noticed that the interviewees prior to Isabel didn't use the word project during the interviews but it was Isabel who made the distinction about terminology quite clear. Isabel's distinction was not about word choice; it was about recognizing the how permaculture was integrated into her life. Her experience of permaculture opens

the door for further research into permaculture as a lifestyle and/or worldview and the process by which that occurs.

### **Interview 6, Paco (Appendix Q)**

Paco is approximately 70 years old and his interview focused on the impact of the war on the environment, his war experiences, and his views on government. Paco's stories about the war were nested into his answers to the question about noticing changes in the environment. The interview schedule did not contain questions about the war and so Paco's association between the war and the environmental work he is doing reflect his own connection between the two experiences. He said that using plants as medicine during the war was perhaps his first introduction to permaculture. He frames his own permaculture work as a testament to what he witnessed during the war. His experience teaches us that the war context is ever present for some individuals and that an interest in permaculture can arise from a war experience.

### **Interview 6, Karen (Appendix R)**

Karen's interview had a heavy focus on permaculture challenges and conflict resolution. She serves as the director of IPES and her interview communicates both the experience of organization conflict and the challenges the institute faces in their daily work. As lead trainer during the permaculture design course, she intuitively tried to implement more conflict resolution training into the design course but she did not research specific conflict resolution models. Her interview highlights the need to develop models that integrate conflict resolution with ecological training.

### **Interview 7, Carmen (Appendix S)**

Carmen's interview focused on permaculture training and permaculture practice in a unique way. Carmen did not have her permaculture design certificate although she did begin attending a course but left the course due to personal circumstances. Carmen's permaculture practice is quite advanced and she often talked about sharing her knowledge with others. Never finishing the official design course does not keep Carmen from training others or developing her own practice. She views herself as a trainer and although she would like to complete the course in the future, her passion for training comes from sharing her own experiences with others. Permaculture is not about receiving a design certificate as a source of legitimization. The source of knowledge comes from permaculture practice.

### **Interview 7, Fermin (Appendix T)**

I interviewed Carmen and Fermin together and he often responded to Carmen's experiences by saying "I agree" or nodding his head in agreement while she was talking. When Fermin responded to a question inquiring about personal impact permaculture has had on his life, he began to discuss an addiction issue. He said that prior to working in permaculture at the demonstration site, he stayed away from people because of his former addiction issues. He states that since being involved with IPES and permaculture that he has become part of society again and is looking forward to attending the design course the next time it is offered. Fermin's experience raises questions about the role of permaculture in facilitating social integration.

### **Interview 8, Elizabeth (Appendix U)**

Elizabeth had been volunteering on a privately owned organic farm prior to volunteering at the IPES demonstration site. She travelled to El Salvador to learn more about the daily experience and routines of organic farming which she plans to integrate into her own plans of starting an organic urban farm in Louisville., KY. Elizabeth was able to compare and contrast her organic farm experience with the experiences she was having while learning permaculture through practice at the IPES demonstration site. She said that there was a sense of community at the IPES demonstration site that was not present at the organic farm even though the people at the farm had known each other for decades. Both sites were working without chemicals and yet the organic work in and of itself didn't necessarily involve community development among farmers. The organic farm workers all live in the vicinity of the farm and they technically form a geographic community. Elizabeth also observed the farmers did not integrate the organic methods they used at work into their personal plots.

Elizabeth's observation about permaculture and community building highlights the difference between applying sustainable agricultural methods and learning sustainable agriculture through permaculture. Permaculture is based on systems-thinking and the successful practice of permaculture depends on the ability of the practitioner to create mutually beneficial relationships between the elements of their natural environment. I propose permaculture's ability to contribute to peacebuilding is rooted in this relational dynamic within permaculture. When people learn to meet their basic human needs through a model that emphasizes building relationships between natural elements, a



fertile foundation for community building is also provided. Several of the interviewees communicated they did not view their farming activities or permaculture practices as one part of their lives, it was their lives. The contribution of permaculture to the conflict resolution field is that it provides a way to meet basic human needs through a process that is based upon creating beneficial relationships that support the construction of positive peace.

### **Interview 9, Renia (Appendix V)**

Renia's interview centered about the personal impact permaculture has had on her life and her motivations for being a permaculture promoter for IPES. Reina spoke about the positive impact that permaculture has had on her household in terms of increasing access to available food and she shares stories of her young daughter advocating to protect the environment amongst her school-aged friends. She and her daughter work together in their vegetable plot. Reina thinks her daughter will become an excellent permaculture practitioner and views this as the legacy she will leave her daughter. Permaculture is contributing to relationship building within Reina's family and other interviewees also spoke about working with their children or their parents as part of the impact permaculture had on their lives.

### **Interview 10, Noemi (Appendix W)**

Noemi is one of the more innovative permaculture practitioners that I interviewed. Her extensive permaculture practice has contributed to her food independence as almost all of the food consumed by her household is grown on her land. She describes her drive to

keep experimenting with permaculture techniques to create solutions for environmental problems. She was the oldest female interviewee and she was guerilla combatant during the war. She worked to help integrate guerilla soldiers after the war and she views permaculture work as an extension of her commitment to social justice and community organizing. Noemi taught me about the process of permaculture through her detailed examples of experiments she carrying out and this helped me understand permaculture as a process rather than a set of rules or techniques.

#### **Interview 10, Gertudis (Appendix X)**

Gertudis spoke about the day to day process of promoting permaculture and organizing people to work together to address their local environmental problems. Although all of the interviewees spoke about their work with great enthusiasms. Gertrudis was very candid about the hard work that goes into organizing people and encouraging them to practice permaculture. Permaculture practice can provide much needed solutions to local problems but not everyone in a community is interested in the work when the promoters begin working in the communities. Permaculture does not become part of a community instantly. Many people are skeptical of the approach upon hearing that it requires more labor and initial decline in quantity of agricultural products even though the quality of the products will be better. Permaculture design principles require implementing small and slow solutions to create environmental change. Permaculture works within an extended time frame which flows out of the design principles of intensive observation, implementation of small and solutions, and application self-regulation and feedback. Permaculture

works with nature itself and therefore the natural time cycles must be integrated into the work. Many of the interviewees spoke about the importance of having a demonstration site to help them promote permaculture within their communities but the sites themselves take time to develop.

Lederach (1997) writes that the process of building peace must operate within a time framework that reflects the long-term processes of transforming conflict and building peace. His time frame starts with the immediate crisis intervention activities and the continuum ends with activities that assist in building a desired future. Permaculture is long-term process for building peace and contributes to the creation of a desired and sustainable future.

#### **Interview 14, Valentin (Appendix Y)**

Valentin is approximately 19 years old and is the youngest interviewee. Even though he is quite young, he spoke about changes he has seen in his local environment including the loss of a forest to development and the water levels receding in the river that is located in his community. He would like to receive more permaculture training particularly in solar and natural building techniques. His community is historically known for its fresh water seafood and Valentin wants to help restore that cultural identity through aquaculture. His desire to learn about the variety of permaculture innovations that are not currently being practiced in El Salvador emphasizes that permaculture is not defined by one set of practices. It will be interesting to follow the development of permaculture technologies in El Salvador and the impacts those activities may have on the communities.

### **Interview 11, Norma (Appendix Z)**

Norma spoke about the impact permaculture has had on her community and her personal food security. She stated that learning about ecosystems in permaculture has helped her visualize her own community as a series of interconnected webs. She defines community by the level of organization or shared vision among the people who live in a particular area. She also states that each community needs to build a relationship between the human elements of the community and the natural elements. When discussing her motivation for practicing permaculture, Norma was very enthusiastic about sharing permaculture with other people. She told a story that whenever she is on a bus traveling between communities or to come to the IPES office, she always talks to the person seated next to her about permaculture. She said it was a great conversation starter and that many times she learned something new to try in her permaculture practice based on these conversations with people on the bus. Norma doesn't limit speaking about permaculture to the time when she is officially teaching but she uses the topic as a way to engage in conversation with people and views the conversations as learning opportunities for the other person and for her. Norma's experience indicates permaculture can contribute to dialog between various members of society. I also found myself discussing permaculture with people that I met in various situations while I was in El Salvador. People were curious as to why I was in the country and when I would explain my research to them, people would start sharing memories about how their parents or grandparents used to plant their plots. People instantly connected with the idea of permaculture and often asked me to describe the permaculture practices I was observing. The environmental peacebuilding literature

focuses on using the environment as a tool to encourage cooperation between parties. Norma and my experiences of talking about permaculture extend that concept to using environment as a tool to create dialog.

### **Interview 11, Regino (Appendix 1)**

Regino spoke about length about rehabilitating the land where he lives through permaculture. He specifically bought the challenging plot of land in order to rehabilitate it into a working demonstration site. When answering the question about what community signifies to him, Regino defined community as the expression of the values that underpin the design principles. He said that community is the creation of mutually beneficial relationship between humans and between humans and their environment. It was in this interview that the theme of relationship building with the environment emerged.

### **Interview 12, Maria (Appendix 2)**

Maria spoke in depth about permaculture and her community organizing work. She works with women's groups and sees permaculture as an extension of that work. She spoke about reducing the use of agricultural chemicals as a women's health issue. Maria also discussed the war and its impact on her community. A series of massacres took place in the area and many people joined the guerilla army as a result of the witnessed violence. Maria talked about the land transfer program that was part of the peace accord and how the program was a failure because even though people got access to land, it was severely degraded and not appropriate for farming. The beneficiaries of the peace accord land did not receive any form of technical support. She believes if beneficiaries would

have received permaculture training during the initial years after the conflict, people would not have sold off their lands only to turn around and rent land where they could produce food. Maria also spoke at length about the challenges of getting people in the community involved in permaculture work. She stressed the importance of teaching by example. She said that her most valuable teaching moments came from her neighbors observing her practices and seeing the results of her work. When they saw the fruits of her harvest, her neighbors wanted seed from her field. Maria turned this into a teaching moment assembling group of neighbors together to explain how to prepare the soil and how to select seeds for planting. Maria did not get frustrated when her neighbors would comment that she was wasting her energy making green pesticides. She had the foresight and the patience to nurture future teaching opportunities by living permaculture. She literally grew her dialog and teaching opportunity. Maria's ability to plant the seeds of permaculture provided her a dual harvest. She had a remarkable harvest of native corn as well as harvest of interest in permaculture. For me, Maria harvested peace and it is from her story that this dissertation gets its title.

### **Interview 12, Thelma (Appendix 3)**

In the her interview, Thelma stressed the importance of improving health through organic agriculture. She contrasts conventional and agriculture based on the impact each has on health. She said that she used to be become severely ill as a result of the chemicals she used while farming and reports that she has not been to the doctor with symptoms of chemical poisoning since she began practicing organic agriculture. Thelma does not see

the distinction between conventional agriculture and permaculture simply as the presence or absence of chemicals but rather she sees the distinction as a philosophical one. For her, the permaculture design ethics and principles that distinguish permaculture from conventional agriculture. The permaculture design ethics and principles distinguish it other sustainable agricultural models as well this distinction provides an opportunity to develop conflict resolution oriented agricultural models.

#### **Interview 13, Miguel (Appendix 4)**

Miguel is the director of the national organic agriculture organization in El Salvador. He spoke at length about permaculture representing sustainable living education. For him, sustainability education reclaims traditional agricultural practices that were devalued and displaced by conventional agriculture. He believes organic agriculture and permaculture are tools to create a culture of peace. He also spoke of permaculture as a tool for educating people about structural violence and framed permaculture as tool for challenging the structural violence present in Salvadoran society. He sees the practice of permaculture as a political act. Miguel stated the transformation of a society begins with the transformation of agriculture. Permaculture as practiced in El Salvador transforms dominant agricultural system in a way that can create structural change in other aspects of society. The way people grow their food can contribute to the way the view their world.

#### **Ricardo, Interview 13 (Appendix 5)**

Ricardo was literally in the middle of designing an urban permaculture course when I arrived to interview him and Miguel. He agreed with Miguel's analysis of permaculture

as an educational tool and mechanism for developing a culture of peace. During the interview, Ricardo began to develop his own theory of permaculture and conflict prevention. He said it was the first time he thought about permaculture as a way to prevent conflicts. Initially, he talked about permaculture providing opportunities for people to work together in their communities and then he began develop the idea of permaculture as a conflict prevention technique at the global level. For him, resource competition lies at the heart of most conflicts. Permaculture design is based upon using local resources to correct issues of scarcity. Ricardo reasoned, if governments were to adopt a permaculture framework and began to use the resources present in their countries rather than appropriating resources from other countries, the dynamics of international politics would be radically changed.

Ricardo's framing of permaculture as a conflict prevention tool is powerful. Conceptually, permaculture challenges the theory that resource scarcity will lead to conflict. Further research into how permaculture practice applies to different types of conflict and conflict stages will help clarify the potential for permaculture to function as a conflict prevention tool. Permaculture is being practiced in countries with extreme resource scarcity issues but the experiences of these permaculture practitioners has yet to be documented from a conflict resolution perspective. In order to develop an integrated model of permaculture and peacebuilding, more research is needed to understand how permaculture functions under different conditions. Permaculture is a practice that is informed by a set of ethics and principles which are expressed according to local culture. Permaculture, by design, a flexible framework that is meant to be adapted to meet local



needs and local conditions. The challenge in developing theory from permaculture lies in trying to identify universal experiences while working within a framework that is adaptive by nature.

## **Chapter 9: Permaculture as Peacebuilding**

This chapter presents the development of an environmental peacebuilding framework derived from the data analysis and grounded in the experiences of permaculture practitioners in postconflict El Salvador. Permaculture as peacebuilding has been discussed in the context of environmental restoration but the multi-dimensional impacts of permaculture expand its usefulness beyond the agricultural and context to address issues of structural violence in postconflict contexts.

In discussing the difference between personal and structural violence, Galtung (1969) wrote, “There is no reason to assume that structural violence amounts to less suffering than personal violence” (p. 173). The basis of structural violence is uneven distribution of power within societies (Galtung, 1969) and subsistence farmers are highly marginalized from the political power networks that decide the policies that distribute social assets in El Salvador. Just as Galtung created a distinction between personal violence and structural violence, he also distinguished between personal and structural experiences of peace. According to Galtung, an absence of personal violence creates negative peace while an absence of structural violence creates positive peace (1969, p. 183). In turn, peacebuilding theories and processes must work to achieve both types of peace.

Ricigliano (2003) created a typology of peacebuilding interventions: political interventions made up of processes that are mainly concerned with transactions between leaders and organizations, social interventions which focus on the underlying relationship between groups in conflict, and structural interventions that focus on repairing or rebuilding the underlying system that are necessary to sustain a peacefully functioning society (p. 447). According to Ricigliano (2003), the goal of structural peacebuilding is to build assets upon which a peaceful society can be built that satisfy the underlying needs of the people within the society. Permaculture as experienced in El Salvador encompasses all three of Ricigliano's typologies to create an environmentally-based political, social, and structural peacebuilding theory. Ricigliano (2003) highlights the need for increased collaboration networks between separate peacebuilding actors which he calls networks of effective action. When networks of effective action are in use, agencies involved in structural peacebuilding should seek to collaborate with other actors/agencies that focus on minimizing disparities among groups (social peacebuilding) and also collaborate with actor/agencies that focus on maximizing opportunities for resolving disputes peacefully (political peacebuilding). Ricigliano (2003) is arguing for more collaboration between different types of agencies and organizations that perform one distinct form of peacebuilding, while permaculture is actually a stand-alone example of a network of effective action. The framework of permaculture as peacebuilding creates an integrated model of peacebuilding, and instead of increasing collaboration between separate actors, permaculture serves as a dynamic holistic environmental peacebuilding theory that addresses political, social, and structural issues.

The hybridization between environmental peacebuilding and structural peacebuilding creates a plethora of new opportunities to build positive peace. In fact, the original research idea to explore permaculture as a peacebuilding tool came from my own experience of conceptualizing permaculture as a local response to structural violence while I was attending a permaculture design course. When I was learning the permaculture ethics and principles, I immediately recognized that I could take the permaculture training material and method for analyzing natural systems and use it in a conflict resolution and peacebuilding class without anyone ever realizing that the model was actually a sustainable agriculture model. The skills of observation required to work with natural systems is complementary to the skills needed to work with conflict systems and therefore it seemed appropriate to explore the connections between permaculture and conflict resolution practices. My journey with permaculture began with my conceptualization of permaculture as a tool to combat structural violence and coincidentally my interviews in El Salvador ended on the same topic.

Miguel (Interview 13) was the director of MAOES, the largest organic agriculture organization in El Salvador. The organization works to promote organic agriculture throughout the country by working with and education small- to medium-sized agricultural producers. Miguel described the connection between permaculture and structural violence in response to a question in which I asked him to explain what MAOES does as an organization and how he connected permaculture and organic agriculture. He said:

As the main organic agriculture movement organization here in El Salvador, we consider organic agriculture and permaculture tools for social

transformation. We do not consider permaculture to being a technological package, but rather it is practice and a philosophy for living. Permaculture and organic agriculture reclaim the principles of sustainability and of society—principles that were lost in the implementation of an industrialized agricultural model. We believe that organic agriculture takes back the principle of the person and the well being of the person as a fundamental objective. All of the practices have to support that philosophy and we conceive of the development of the person in harmony with the environment and that is to say that the sustainability of human generations is based upon the correct and appropriate interpretations of phenomena and of nature itself in which the human beings are one species inside of that net of living communities. That is one of the principles that has to be clear about how to interpret what is being observed so that we can design systems of production and life that support those fundamental principles. That is our reason to exist (MAOES) as a source of information. We speak of organic agriculture; we place a lot of emphasis on the principle of life and development with sustainability and equality. It is not just about not using chemicals; it has a philosophy behind it....For us, the study of permaculture gives us an important way to construct sustainable production systems and the way it does that is through rescuing the ancestral knowledge and the interpretation of nature as a base for the development of community and human systems.

A development of new knowledge is the base of how we can rescue the knowledge and how we can interpret natural laws in order to generate new knowledge. We see it as a spiral and the principles of permaculture give us an extremely important base to apply the design principles that are the base. That is to say that we don't conceive sustainable systems without including the development of human creativity to design its systems. That is like the biggest base for us of how permaculture works for production. We consider it as complimentary. Organic agriculture is also based on principles such as sustainability, interpretation of nature, the development and interpretation of the soil as a living organism, and all of its physical, chemical, biological, zoological interactions. The task is urgent and is why we do not conceive of organic agriculture without permaculture because it is not possible. That is why in the practice we have gotten closer to the permaculture movement because as an organic movement we are coordinating and trying to learn through exchange.

We consider organic agriculture and permaculture as the tools to create a culture of peace—considering different forms, eliminating the different forms of violence that society is exposed to. We consider malnutrition—the lack of access to food and safe foods for part of the population, for the majority population, that is—to be a form of violence. That is something that we have learned because in the conventional system we do not have that kind of wide vision for the concept of violence and that violence is

only physical aggression, but no, there is a violence with the character of structural violence, systemic violence. And so organic agriculture and permaculture respond, and they look to eradicate those structural forms of violence.

I think that the permaculture and organic movement is getting stronger in El Salvador because our people, particularly our rural population, out of necessity, is looking for models of liberation, that is to say, of transformation, where you achieve liberation and autonomy. It is revolutionary because we have a revolutionary way of thinking, and organic agriculture and permaculture give us many elements and gives us tools for the search of that social transformation. Like we say, a good friend of mine says that organic agriculture, more than being a technological instrument tool, is an instrument of social transformation. It searches for liberation, sovereignty, independence, and self-esteem of the people. It is a political project more than a philosophy; it is a political conviction. Because we cannot think about the development of human beings without linking it to political context that the country is developing in and that the region is emerging and ultimately is tied to global politics. We are in a model that moves forward with principles that are totally different to those of permaculture and organic agriculture. You could say that they are different political objectives. (Miguel, Interview 13)

Ricardo is a program manager and permaculture trainer at MAOES and also participated in the interview. He immediately followed Miguel's answer with this:

Another aspect that is often not spoken about is how to resolve conflicts or, better said, how to prevent conflicts. You can look to permaculture as an emerging answer to an energy reality that is changing in the world and is generating conflicts, conflicts over petroleum and all of that, so permaculture is an answer to that energy reality that every day becomes more difficult. It is an alternative to stop depending on petroleum, and just like with organic agriculture, coincides with permaculture in that it is based on respect or ethics. Without a common ethic, what is respect? Respect for life, respect for all human beings. The model of dominating, industrial agriculture based on agrochemicals and now based on biotechnology is not compatible with permaculture because that model always depends on petroleum, always depends on petroleum. Organic agriculture does not; it tries to make use of the natural resources and local resources. Permaculture always thinks that if we get some land, a resource, we need to try to leave it better than how we found it. It goes beyond.

Before, people used to talk that we have to take care of the environment and all that, but permaculture thinks that we don't only have to take care of it but that we have to make it so that our resources and our environment have more capacity to sustain life—to increase that capacity. It is some-



thing that I think we don't talk about too much, about how permaculture can have an influence in the prevention of conflicts. In regard to the dominant culture that is based on consuming and consuming, that is also completely contrary to the principles of permaculture, which tell us to consume only what is necessary so that we don't abuse the resources.

I also think that global politics, which always initiates conflict over resources, even if they invent some other reason for the conflict, in the end it is really about resources and now we have terrorism and combating the drug trade and lots of other pretexts that are used to hide the conflict are really rooted in a fight over resources. It has been that way historically and it still is that way. I think that if all these governments could have an understanding of permaculture and a deeper knowledge, they wouldn't need to go looking for resources outside of their borders but that with this they could resolve their problems internally. And that is what permaculture looks for— that you won't be short on water, that you won't be for want of food that is the most important, a roof, but that hasn't been the rules of the game.

The countries that supposedly have access to the information and knowledge and scientific discovery, they have not focused on solving their problems internally with what they have. No, they think, well, we don't have something and that country in the third world has it and let's go conquer and let's appropriate it for ourselves. It is also true at the global level

as well; there is a poor distribution of wealth and injustice and that is why they haven't applied these types of principles at all. There hasn't been a design and that is what permaculture looks for—design and to create order with reason, to put things in order. But history has not been that way, it has been a mess in all the aspects and the deficiencies and problems come and you need to fill those voids and those deficiencies are surging due to consumerism for things and it is waste, a squandering and then a deficiency arises and you have to go look for it in other places because it isn't here anymore; it is finished. I think permaculture helps us think about these things. (Ricardo, Interview 13)

Miguel and Ricardo clearly viewed permaculture as tool for human and social development. Permaculture is revolutionary in its approach to achieving self-sufficiency and it is political by combating the roots causes of structural violence. Ricardo's discussion about permaculture as conflict prevention turns the concept of environmental scarcity leading to violent conflict upside down. Permaculture works precisely under the conditions of scarcity to create abundance by using local resources, and further research into the relationship between resource scarcity and permaculture as conflict prevention should be developed.

The grounded theory approach used during this research required the researcher to write memos which aided in reflection and theory development. I created memos for each of the interviews, and since the MAOES office was my last field interview, within the

corresponding memo I reflected on what I had learned from the interviews overall. The following is an excerpt from that memo, which was written about an hour later:

Permaculture is teaching people how to analyze their local conditions, use local resources to address their resource problems, and provide for their basic needs. After the first few interviews, I began telling Karen that what I was seeing was something more than sustainable agriculture or sustainable development. I started calling it transformative environmental peacebuilding. I chose transformative because the interviewees communicated to me that permaculture is part of their lives and integrated into their lifestyles, their families, and their communities. It is transformative because it has changed the way that people view the environment and their interaction with the environment, and has developed a systems-thinking approach to their everyday life. The power of permaculture as a conflict resolution tool lies in the application and therefore the transformation of a nature-based systems-thinking approach to larger social issues within communities and ultimately in society. When you have former guerilla fighters becoming community leaders and choosing to engage with local governments to develop ecological plans for their communities, many would agree that transformation has occurred. When women become empowered to become community leaders in a traditionally male-dominated society, transformation has occurred. When people feel like they can sur-

vive crisis because of the skills they have learned through permaculture, transformation has occurred. (Memo 13)

Permaculture as peacebuilding provides a powerful theory for the field of environmental peacebuilding. Permaculture impacts multiple dimensions of practitioners lives, builds community by encouraging cooperation and dialogue, and contributes to the development of local economies through a holistic model that address war-induced environmental damage and postconflict structural violence. Permaculture is a peace-supportive problem-solving approach for addressing local environmental challenges that is culturally appropriate for rural subsistence farmers. Additionally, permaculture supports community building and relationship building between individuals and nurtures a long-term relationship between people and their natural environment. The development of the relationship between person and environment is unique to the theory of permaculture as peacebuilding and significantly contributes to the fields of environmental conflict resolution and peacebuilding by creating agency for the environment in a way that expands the system of actors and possible solutions for addressing serious environmental challenges.

## **Chapter 10: Permaculture's Contributions to the Field of Conflict Analysis and Resolution**

The previous chapters have discussed permaculture practice as a peacebuilding activity and I developed a grounded theory of environmental peacebuilding based upon the experiences of permaculture practitioners in El Salvador. In this chapter I explore two unique contributions the permaculture framework brings to the field of conflict analysis and resolution. The first contribution looks at permaculture as an alternative to sustainable development and the second contribution applies the permaculture design method to the process of environmental conflict mapping.

### **Permaculture as a Response to Sustainable Development**

The literature review on environmental peacebuilding showed the traditional approach to environmental peacebuilding has revolved around environmental cooperation. In 2009, the United Nations Environmental Program (UNEP) report, *From Conflict to Peacebuilding*, broadened the concept of environmental peacebuilding to include working with the environment directly in post-conflict situations, which was a major contribution to the literature. The report categorized environmental peacebuilding into activities that devel-

oped sustainable livelihoods, contributed to dialogue, cooperation, and confidence building, and contributed to economic recovery.

Since permaculture had not previously been studied from an environmental peacebuilding framework, it was not certain that it would reflect the activities included in the definition proposed by the United Nations Environmental Program. The three aspects of the definition: sustainable livelihood, cooperation and dialog, and economic recovery were applied as codes to the interview data. Data analysis revealed that permaculture practice in El Salvador reflects the environmental peace-building activities defined by the UN (see Appendix 6).

The UNEP description of sustainable livelihood development includes the following activities: provision of basic services, recovery, and management of natural resources; environmental damage coping strategies; chronic environmental problem management; and minimizing vulnerability to natural hazards and climate change. Water sanitation and rain catchment permaculture projects addressed the critical need for water in the communities as chronicled in the interviews. Soil conservation and soil rehabilitation projects improve food accessibility by increasing soil fertility, and several communities were growing medicinal plants to assist in meeting their medical needs. Permaculture practitioners also worked within the communities to build schools, community meeting places, and ecological ovens for baking. The advances that permaculture innovation have brought to the communities in regards to improvements in water, soil, and overall ecological conditions provide the foundation for sustainable living for rural farmers in El Salvador.

The second aspect of the UNEP definition of post-conflict environmental peace-building includes work that contributes to dialogue, cooperation, and confidence building. Three types of cooperation emerged from the interviews: within communities, between communities, and with other institutions and government agencies.

Cooperation within communities took the form of seed exchange networks being created, individuals working together to implement permaculture practices, which interviewees described as a unique aspect of permaculture for their communities, and encouraging collaboration between male and female farmers.

Interviewees also discussed the development of cooperation between communities. A particularly important example of this inter-community cooperation is seen in the development of two ecological networks made up of multiple individuals from each of the communities where permaculture is being practiced. The networks formed out of a series of workshops aimed at having the communities present the permaculture work they were doing to local institutions to build collaborations within the communities. According to IPES director Karen Inwood,

During this process, they got to know each other and decided they wanted to form an organization at the local level. They came together, decided their mission, vision, and what they wanted to work on and started reaching out to other communities. They have started working with municipal governments to develop ecological plans. (Interview 6)

Permaculture involvement leading to cooperation with institutions and government is an interesting development, particularly given these communities' history with government

institutions. The fact that ex-combatants would engage with governmental institutions to support environmental work was unexpected and supports the environmental peace-building literature's claim that environmental issues can serve as cooperation items between differing groups. Some of the interviewees spoke about the government, expressing disappointment at its historical record of ignoring rural and environmental issues. However because El Salvador had just witnessed the election of Mauricio Funes, the first candidate to win a presidential election from the FMLN party two months prior to the interviews, there was an optimism among some of the interviewees about the possibility for more governmental engagement with and support of permaculture work and ecological policy in the country.

Interviewees also spoke about initiating work with other NGOs present in their communities; this was a turning point because many of them had experienced disappointment with the relationships that NGOs had with communities after the war. In fact, in El Franco, where my interview with Oscar took place, a local NGO generously rebuilt homes that were destroyed after Hurricane Stan, but the project caused some tension between the NGO and the people living in El Franco because the design of the new homes included flush toilets and there is a severe water shortage in that community.

The community attempted to work with the NGO to redesign the homes without the flush toilets in lieu of creating more living space and advocated moving the wood-burning stoves outside the home, but the NGO would not change the plans. The result was that the homes had indoor wood-burning stoves that produced black smoke along all the walls and made the internal air of the home difficult to breathe in, and the bathrooms



with the flush toilets were used as closets because there was no water to flush. The community was able to build composting latrines with the help of IPES.

The teak tree project that Renia (Interview 9) spoke about is another example of well-intentioned NGO projects negatively impacting the local community. When the teak trees soaked up the scarce water and left the community without lagoons and with low water levels that required water rationing during the summer months.

In other communities, NGOs distribute seed and chemical agriculture packages as a way of helping the community, which make the work of the permaculture promoters more difficult because people gain access to easy methods of conventional agriculture and are not interested in learning about labor-intensive permaculture methods. Many of the interviewees witnessed the well-intentioned works of NGOs in their communities, but also saw the projects lose momentum as the immediate post-conflict emergency phase passed. However, there was also a new spirit of collaboration from both the local NGOs and grassroots permaculture community promoters to work together in addressing local needs. IPES has had a difficult time getting NGOs to collaborate with the institute partly because the institute developed outside the immediate NGO community that had developed during the war and partly because IPES is not affiliated with political or religious groups, while the majority of NGOs in the country are aligned with either political or religious organizations. Karen noted that recently NGOs have been contacting the institute to learn more about them, stating that they have learned about the work IPES does through people talking about IPES in the communities where the NGO is working.

The final aspect of the UNEP environmental peacebuilding definition is the work that supports economic recovery through economic development, employment, and budget revenue. The definition is oriented toward national economic recovery, and during the coding of the data, I did not find examples of economic development that met the level of analysis specified by the definition. I did, however, find examples of interviewees discussing the household financial benefits of growing food. Several interviewees mentioned the development of a local exchange of food products.

By creating an alternative to consumer-based food purchasing models, both by growing their own food and by exchanging it amongst themselves, a local economy is developed. Curtis (2003) calls this process *eco-localism*. Eco-localism comes out of the ecological economics literature and proposes that environmental sustainability must be based upon the creation of local, self-reliant, community economies. (Curtis, 2003, p. 83) Eco-localization is a distinct alternative to the dominant neo-classical analysis of sustainability, and it is the economics of local community. Curtis writes,

Eco-localism is the economics of local (placed) community. Its goal is to establish a healthy community economy. This requires the preservation of the eco-system on which it depends...[E]co-localism recognizes the social nature of human beings as well as the impact of place on them. It rejects the place-less, community-less economic actor. (p.85)

Eco-localism proposes the sustainable use and preservation of local ecosystems and requires locally adapted knowledge, culture, and practices based upon symbiotic forms of social, physical, human, and financial capital. Social and human forms of capital take

precedence to financial capital, and individuals may meet their needs by sharing or exchanging products and services. Reina (Interview 9) provides an example of eco-localization taking place in the permaculture communities:

Sometimes going out to the countryside, you see how the people have their different styles of work, styles of sharing with their people, and you say how good that is. It is the best part. I had heard that before people used to exchange food in communities, like if someone didn't have beans, they would exchange beans with the person who had corn, and I would think how was that possible? Before, I couldn't imagine people doing that, I didn't believe it, but now I see it with my own eyes, and I say, well yes, it is and how beautiful it is because you see how the people are living together and to see that harmony and friendship and love and that they protect each other and that if someone only had corn and another only beans, it would be illogical that the one with the beans would be there just with all those beans and not to share them. Permaculture even does that: people share. If I have green onions planted in my vegetable garden, you can give me a tomato and I can give you a bunch of onions and that is a very beautiful way to live and that very much motivates my work. I think that is something unique to permaculture because people growing just organic or using conventional methods don't have that same interexchange. That is what is good about permaculture, people can do what their hearts tell them to do.

Interviewees spoke about the financial benefits of practicing permaculture: reducing costs by not purchasing agricultural chemicals and seeds, growing food that they used to buy, and having surpluses of certain food items that they either shared with their neighbors or exchanged for other food items, but the interviewees did not speak about the financial benefits separately from the human and social benefits of permaculture.

Curtis (2003) argues eco-localism is a radical reorganization of economic life that rejects globalization and reorients economic theory to represent a broader range of human values and needs that include the natural world. (p.100) The local economies developed in the interviewees' communities are not recognized in the UNEP definition of economic activities that contribute to peacebuilding. The UNEP definition comes out of the international political orientation of development as peacebuilding. The entire concept of development implies there are people who have to escape from an undignified condition of underdevelopment and become developed. (Esteva, 1992) Even though the intentions of development are often to encourage the common good, the process of development can be disempowering to the individuals and societies that are the recipients of development activities. Development is often tied to economic institutions and not aimed at supporting local cultures or, in the case of El Salvador, local economies.

Sachs (1992) in writing about the emergence of the environmental development concept highlights the contradiction of using the words "nature" and "environment" interchangeably when, in reality, the terms represent opposing views.

There has rarely been a concept that represented nature in a form more abstract, passive, and void of qualities than "environment"...Sticking the la-

label “environment” on the natural world makes all concrete qualities fade away; even more, it makes nature appear passive and lifeless, merely waiting to be acted upon. (p. 34)

Sachs goes on to argue that the conceptual marriage of “environment” and “development” reduces ecology to a set of managerial strategies aiming for resource efficiency and risk management (p. 35).

The UNEP definition speaks of providing basic services and managing environmental problems, while permaculture seeks local solutions for creating abundance and views working with nature as a collaboration and teaching process. Sachs (1992) is critical of the political institutionalization of environmental issues that emphasizes an epistemology of intervention adopted by the development field. He writes:

Many rural communities in the Third World do not need to wait until specialists from hastily founded institutions on sustainable agriculture swarm out to deliver their recipes against, say, soil erosion. Provision for the coming generations has been part of their tribal and peasant practices since time immemorial. What is more, the new centrally designed schemes for the “management” of environmental resources threaten to collide with their locally based knowledge about conservation. (p. 33)

Permaculture practice is based upon indigenous and local knowledge and provides an alternative to intervention-focused environmental development. Permaculture is not brought in from the outside but is rather cultivated from local experiences. Sachs’ statement on the provision for future generations being part of peasant practices since time

immemorial implies that communities who have an ancestral future-oriented worldviews also have the accompanying ancestral techniques for engaging with their environment in a future-supportive way. This was not the case in El Salvador. Interviewees spoke of a connection to an agricultural past, but they also recognized that the practices of their forefathers had practically been lost with the introduction of conventional agriculture and war displacement and deaths. Interviewees spoke of permaculture as way for them to save this ancient and local knowledge. Practitioners are integrating moon cycle planting practices based upon ancient Mayan traditions and engaging older farmers to learn techniques used locally prior to conventional agriculture. Permaculture serves as an alternative to intervention-oriented environmental development and works to revive local agricultural traditions when the traditions are no longer part of the daily agriculture practices, facilitates the eco-localization of economies, and contributes to sustainable living and cooperation.

### **Permaculture Analysis as Conflict Mapping**

Conflict analysts often use conflict mapping typologies and models to assist them in acquiring and organizing information needed to design and implement appropriate conflict interventions. The mapping approach selected creates the framework for the intervention design, and therefore, the map needs to accurately represent all aspects of a conflict: conflict type, conflict parties, conflict history, conflict context, and conflict dynamics. Once the conflict is laid out generally across these domains, further analysis is conducted on each domain to capture any underlying complexities.

Christopher Moore (as cited in Dugan, 1996) created a “sphere of conflict” typology where he identified five distinct types of conflicts: data conflict, interest conflict, relationship conflict, value conflict, and structural conflict (p. 12), and conflict analysts often begin their analysis of a conflict by assigning it to a conflict type. Conflicts are incredibly complex, and the conflict type concept often provides the first anchor to approaching the conflict system. However, I argue that assigning a type to a particular conflict as the initial step of analysis can often limit the ability of the analyst to fully analyze conflict since conflict types imply conflict causes. Data conflicts are caused by a lack of information, and the analysis of the conflict that follows this initial type assignment can lean towards finding information that supports the lack of information framing. Essentially, the analyst may not recognize a value dimension in the conflict. Although it is possible to apply Moore’s typology in a way that is limiting to analysis, by recognizing that any particular conflict can represent a mixture of the proposed conflict types, the typology remains a useful one.

Environmental conflicts are conflicts over data, relationship, value, and structure. Environmental data conflict is represented by the conflict between systems of agricultural knowledge, which position indigenous methods of working with the earth against a scientifically oriented chemical input approach to environmental management. Environmental value conflict is represented by the competing values of the earth as a resource to be used and managed to increase maximum outputs or the earth as a collaborative ecosystem from which humans can derive understanding that informs human ecological and social design.

Environmental structural conflict is represented by the contrast between international economic power structures that dominate conventional agriculture and environmental development versus the movement towards economic eco-localization. Environmental relationship conflict is represented by opposing views of the earth as an object and the earth as an actor. The interviewees of the present research spoke of the earth as their “mother” and personalized the earth during their interviews using the words “she” and “her.” The concept of nature was moved from a concept of an external environment to a concept of an internal member of human systems. The implication of this personalization of nature for environmental conflict mapping is significant. If a relationship of agency is created between individuals and nature, then nature becomes an active party in environmental conflict. Mapping nature as a party is no easy task, and current conflict resolution mapping frameworks emphasize mapping interests of parties and the power dynamics between them. Although the concept of “mother nature” is powerful for those who experience nature in that manner, an embodied mother does not show up to stakeholder meetings and voice her interests and positions.

Dugan’s (1996) nested model of conflict maps conflicts according to the level where the source of the conflict originates. Dugan’s stresses that within her model, the conflict source levels are interrelated, and she developed the nested concept to reflect that interplay. Dugan’s model begins with an issue-specific level and expands outward to include relational levels, sub-system structural levels, and structural levels. Dugan writes,

While an issues-specific conflict may exist on its own, as we proceed to the other levels, conflicts will always have manifestations on the levels

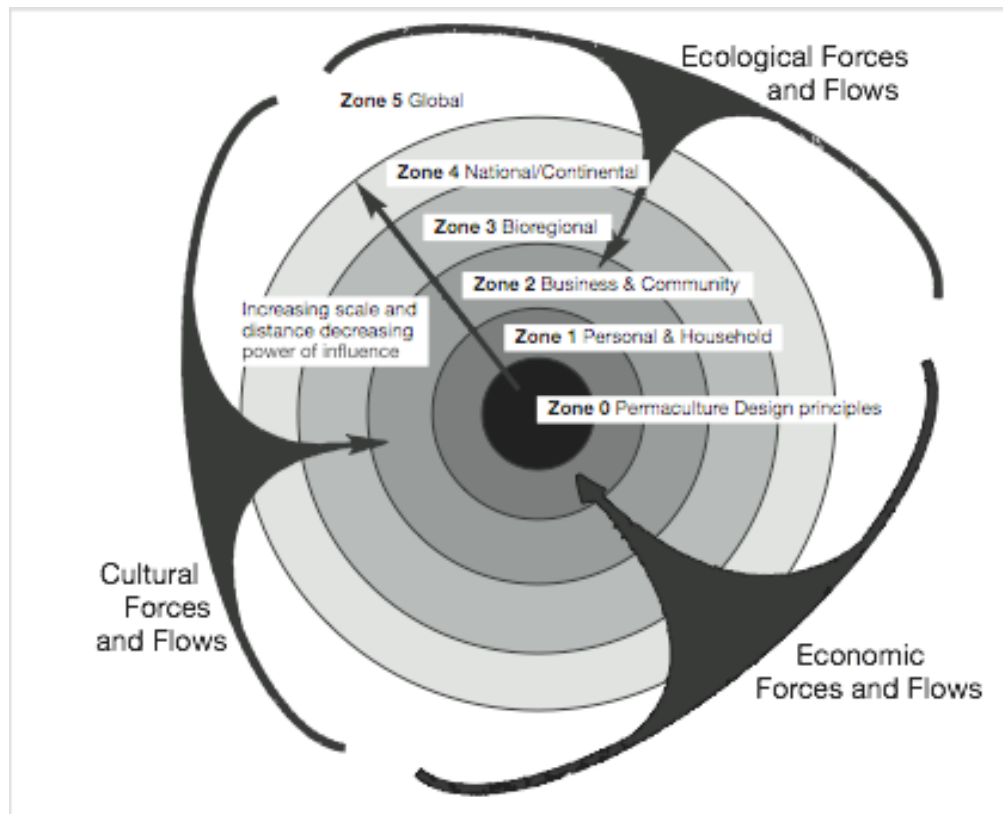


nested within: a relational conflict will always have issue-specific manifestations; a sub-system structural conflict will have both relational and issue-specific spinoffs; and a system-wide structural conflict will have manifestations on all of the other levels. (1996, p. 17)

The application of a source level analysis for environmental conflicts reveals the involvement of each level outlined in Dugan's model. The experience of the environment is global and local and everything in between at the same time. There is a structural global environment and a local environment; there are issue-specific dimension and sub-sub-structural bio-regional dimensions. With so many levels of interaction, how can a conflict analyst include the environment in conflict mapping? Permaculture design analysis provides a framework for environmental mapping that complements and enhances the complexity of current conflict mapping models.

All permaculture analysis begins with observation of the landscape for natural patterns. The permaculture design principle *design from patterns to details* is the foundation of the permaculture zone and sector analysis model. In permaculture, zones are decreasing areas of human activity and sectors represent energy sources coming through the system. Permaculture design aims to mitigate limiting factors to landscape diversification and to strike a balance between natural and cultivated systems. Sectors represent energy sources that pass through a landscape. Permaculture design captures positive energy sources entering the system, such as sun, wind, or rain and disrupts energy that is disturbing the landscape.

David Holmgren (2002) applied the local landscape design concept of zone and sector analysis to meta-analysis permaculture. His model begins with the permaculture design principles and moves through four other zones, ending with a global zone. The sector energy analysis includes ecological, economic, and cultural forces, and the model reflects the structural context of the environment conflict (see Figure 2).



**Figure 2.** Holmgren's Zone and Sector Analysis of Permaculture (from *Permaculture Principles & Pathways Beyond Sustainability*; copyright 2002 by Holmgren Design Services and reprinted with permission of author).

Holmgren's model ties environmental landscape analysis into Dugan's nested conflict sources model. Each of the zones requires an analysis of the environmental conditions that are impacting that zone, but the landscape analysis is not done out of the

context of the larger environmental structure. Permaculture design analysis combines the technical aspects environmental evaluation with conflict resolution mapping. To design any of the zones appropriately, water, vegetation, soil quality, landforms, energy, waste, food production, bio-diversity, and weather patterns will have to be analyzed. The unique contribution of permaculture analysis is that the measurement of the water table or soil type is not separated from an analysis of larger environmental and social systems and complements.

The environmental conflict resolution literature has yet to develop a mapping model that maps the environment when analyzing environmental conflicts. Without an environmental analysis, options for conflict resolution or peacebuilding are not based in local environmental conditions.

Environmental conflict analysts and individuals impacted by environmental challenges tend to leave the analysis of the environment to outside experts who deliver their reports with scientific detachment and not from a perspective of a local relationship with nature. If environmental conflict interventions are to reflect the local needs and local environmental experience, then a local analysis of that experience is needed.

Permaculture is not about relying on a technical other to inform locals about their environmental conditions and management options, but rather, permaculture is about empowering individuals to analyze and design solutions to their environmental problems. In El Salvador, the experienced improvement in water quality via the application of permaculture innovations could have been achieved by bringing in technical experts who would have designed filtration systems and measure success through a series of parts-per-

million water tests, but the introduction of permaculture water filtration technology provided the communities with an accessible framework that empowered them to analyze their water issues holistically. This holistic water analysis included building composted latrines and reducing the amount of chemical fertilizers throughout the community.

Environmental systems are part of the larger conflict and peace systems in which the field of conflict analysis and resolution works. Permaculture design analysis can be used as a mapping tool by conflict analysts, but permaculture design analysis can also be applied as a participatory process that includes the individuals impacted by environmental conflict. Conflict analysts and conflict resolution practitioners aim to develop an appreciation of the complexities of conflict, and permaculture design analysis can be a valuable tool in facilitating a movement towards understanding environmental complexity in a way that is grounded in established conflict resolution models.

## Chapter 11: Discussion

The exploration of permaculture as a peacebuilding tool opens up the possibility of further research on the role of nature in conflict resolution processes. Permaculture as a field of inquiry does not have a large literature of research, but the literatures of garden history and environmental psychology provide an academic framing for the implications of permaculture for conflict resolution inquiry.

Bollens (2006) created a conflict continuum to organize various stages of peacebuilding starting with active war, moving to a suspension of violence, then transitioning to a movement towards peace, and ending with stability and normalcy within the society. Bollens' conflict continuum provides a relevant organizing framework to discuss the implications of permaculture for conflict resolution. Gardens have been studied in the war and suspension of violence stages of Bollens' continuum and in the final stabilized society stage. However, there is a lack of research and relevant theory about gardens and nature in transitioning post-conflict settings. The research presented in this dissertation documents the role of family vegetable gardens in postconflict zones.

Kenneth Helphand (2006) in his book titled, *Defiant Gardens: Making Gardens in Wartime*, provides insight into the multiple roles gardens can have during wars and violent conflicts. Helphand's work chronicles the garden experiences of soldiers and

civilians living in war contexts. Both types of experiences provide rich opportunities for further research from the perspective of conflict analysis and resolution.

Helphand defines defiant gardens as gardens created in extreme or difficult environmental, social, political, economic, or cultural conditions. He writes that defiant gardens represent not only an adaptation to challenging circumstances but that the gardens are also sites of assertion, affirmation, and resistance. His research focuses on gardens related to war in the first half of the twentieth century and addresses gardens built behind on the Western front, gardens built in Warsaw and other ghettos during World War II, gardens built by prisoners of war in Asia and Europe, and gardens built by Japanese American internees in U.S. camps during World War II. More recently, he has researched gardens built by U.S. soldiers in the 1990-1991 Gulf War, gardens created in the wake of the September 11 terrorist attacks, and gardens being constructed by soldiers serving in the current Iraq war.

Helphand's work on documenting the interaction between soldiers and gardens begins with research into gardens created in the World War I Western Front trenches. He found evidence that gardens were created and tended in all of the zones on the front. Helphand chronicles letters from soldiers writing home about constructing and tending to their gardens and describing the length to which they went to create their gardens. In addition to vegetable plantings, soldiers also planted flowers; Helphand found numerous letters from soldier requesting flower seeds to help beautify the soldiers' surroundings. Soldiers often named trenches after streets from their hometowns and even built them signposts. Helphand writes, "gardens near or at the front were a powerful reminder to

soldiers that their home world still existed.... By immersing themselves briefly into a garden world, however small, soldiers maintained contact with the immediate part of their humanity: that of being alive (p. 52).” Gardens also appeared around support facilities such as military headquarters, camps, tent towns, hospitals, and convalescent sites and were critical to the continual supply of food and medicine to local troops.

Civilians also created gardens under extreme war conditions, and Helphand’s research on the 1939 to 1944 ghetto gardens of Nazi Germany provide insight into the role of gardens in extreme war contexts. After the 1939 German invasion of Poland, Jews were forced into walled urban ghettos. The Germans controlled all access to food, water, and other essentials, and Helphand notes that Germans purposefully denied Polish Jews access to parks and green spaces. The four major ghettos—Warsaw and Lodz in Poland and Kovno and Vilna in Lithuania—all have documented gardens. By reviewing memoirs of survivors, diaries, and materials archived by ghetto organizations and by conducting in-person interviews with survivors, Helphand found that gardens played a major role in ghetto life.

After the ghettos were created, many of the pre-war Jewish community and charitable institutions transformed their welfare work to include agricultural training. Towarzystwo Popierania Rolnictwa (Toporol) [the Society to Encourage Agriculture Among Jews] was one of the most active institutions working to produce food in the ghettos of Warsaw and Lodz. Toporol promoted gardens at shelters, orphanages, quarantine areas, hospitals, within housing communities, on balconies, in window boxes, and on roofs. The living space of the ghetto was extended through a transformation of the land-

scape, and several survivors of the war included commentary about the impact of gardens in their memoirs. For many of the survivors Helphand interviewed, the gardens provided needed subsistence to survive the harsh ghetto conditions and also served as a message of hope. The memoirs also recount the struggles of gardening: the backbreaking work of clearing the land with minimal tools and the lack of water resources need to maintain a garden.

In the spring of 1944, ghetto historians documented extremes in garden behavior. Neighbors began to argue over small strips of land. When starvation became rampant, mobs descended into the gardens and, within hours, destroyed the fields in Lodz. In Kovno, hunger drove people to steal still immature vegetable from gardens, forcing the Jewish authorities within the ghettos to declare the vegetable gardens ghetto property and that harvesting and distribution would be administered centrally. However, this led to panic and a mob of desperate people invaded the gardens, attacking not only the ground but also each other for as little as one potato. Memrist William Mishell is quoted by Helphand as writing, “[It] was a tremendous loss of food to the ghetto as a whole. Had the population waited several more weeks, the vegetables would have been twice their size, but nobody was willing to wait” (p. 95). Gardens formed during war conditions straddle a fine line between providing a solution for issues of food scarcity and being a cause of further community conflict. Further research is required into to the dynamics of gardening during extreme resource scarcity and the implications of wartime gardens dynamics have for the using gardening as peacebuilding.



American freelance journalist Ellen Blackman (1997) chronicled her wartime experiences attempting to rescue children from the Bosnian war. Throughout her memoir, she relays stories of gardening. She photographed elderly women who risked sniper fire to tend to their food gardens. She shares a conversation where a friend showed her a small tomato plant growing in the windowsill, “Everyone here, professors and scientists alike have turned to the soil. They have learned to work the earth. Our small vegetable gardens are precious to us” (p. 63). During one story where Blackman herself is running to escape sniper fire, she leaps over a patch of seedlings that is growing in a courtyard of an apartment building because she cannot bring herself to trample the hopes of the gardeners. She writes:

Abandoned cars, ravaged by mortar fire, lay all around the back of our building, but there was also the wonderful miracle of the gardens. The entire front quadrant of the yard bore rows of small, squared off patches of vegetables. Each morning, I never failed to be humbled as I passed by the gardens or to be amazed by the people who tended them. I would observe all the old people and the youngsters on their hands and knees working the ground, their heads bowed. Their patience diligence, and industriousness were incredible. How did they manage to tend to their seedlings in the face of such adversity? They lay themselves wide open as targets for snipers in order to reap their tiny harvest against all odds. (p. 211)

Tom Gjelten (1996) also noted gardening activities taking place in the alleys and courtyard of Sarajevo during the conflict. He also writes about observing people risking sniper

fire to gather nettles and dandelion leaves for food. Mertus and Tešanović (1997) collected stories of Bosnian and Croatian refugees, and within those stories, refugees spoke about creating gardens in the refugee camps to help pass the time and survive the camp conditions. (p. 100)

If individuals begin gardening for food production for the first time during war or refugee conditions, nature work and gardening may not be appropriate peacebuilding tools due to the association of between wartime struggles and gardening activities. Research is needed on the transition between defiant gardening and post-conflict gardening. The impact of war on the relationship between individuals and nature is not fully understood, and the implications for environmental/nature-based peacebuilding are significant. Horticultural therapy and gardening literature highlight the therapeutic benefits of gardening, and in Helphand's and other authors' accounts of defiant gardens, the gardens appear to retain a positive association for the defiant gardeners and the people who witnessed the gardens.

According to Helphand (2006), many of the survivors of the Nazi ghettos had distinct memories of the gardens. He writes, "The ghetto gardens offered places of sensory difference, of quiet, shelter, and elements of the natural world. It offered opportunities for calm, a change in mood, even a temporary forgetfulness about one's conditions. In the ghetto, gardens were only brief respites, but that does not lessen their significance for those moments" (p. 104). The context of the conflict must be taken into account when planning to implement environmental peacebuilding. Pre-intervention analysis requires an assessment of the relationship between individuals and nature and recognition that the

relationship may not be universal within a single conflict context. For some, working with nature will be healing; for others, it will be a painful reminder of struggle. There cannot be an assumption present that gardening activities and permaculture practices are inherently positive experiences for individuals in post-conflict contexts.

Bollens (2006) researches urban planning as peacebuilding and writes about the physical impact post-conflict urban planning policies can have on the social peacebuilding process. “Urban planning interventions can...close or open up a city physically, fragment or integrate a city socially, submerge and dominate cultural identities or support them in a way that nurture diversity within unity, and build cities that reinforce and harden group identities or seek to transcend them” (p. 134). In his case study of Barcelona in the 1970s, Bollens notes the importance urban green spaces had in helping create democracy after the Franco regime. Bollens’ work brings the study of nature and peacebuilding into the urban environment.

The Population Reference Bureau (2010) reports that in 2008 the world’s population was evenly split between urban and rural for the first time in history, and they estimate that by 2050, 70% of the world’s population will live in urban zones. This mass migration to urban centers will have a profound effect on the way societies function and on the development of peace-building and social transformation strategies. The connection between urban planning, green zones, and conflict resolution may prove critical to the long-term success of cities worldwide.

The environmental psychology field researches the impact of nature and green zones on humans, and much of the research comes out of the tradition of attention resto-

ration theory. Attention restoration theory (S. Kaplan, 1995) proposes that exposure to nature reduces directed-attention mental fatigue. Kaplan notes that many settings, stimuli, and tasks in modern life draw on the capacity to deliberately direct attention or to pay attention. The information processing demands of everyday life all take their toll and result in mental fatigue. In contrast, natural settings and stimuli such as landscapes and animals seem to engage our attention in a way that allows us to attend without the work of paying attention. Kaplan suggests that contact with nature provides a respite from deliberately directing one's attention.

There is a growing literature of empirical evidence based upon the restorative effects of natural settings on attention. These studies have demonstrated links between contact with nature and more effective functioning in a variety of populations: AIDS caregivers, cancer patients, college students, participants in a wilderness program, and employees of large organizations (Kuo & Sullivan, 2001).

Mental fatigue may contribute to aggression because of its effects on cognitive processing, its effects on emotion- specifically heightened irritability, and effects on behavior-specifically decreased control over impulses. To the extent that mental fatigue combines these three factors, mental fatigue seems likely to contribute substantially to aggression (Kuo & Sullivan, 2001). Kuo (1992) suggests that the attentional demands associated with poverty and the inner-city environment are likely to place this population at special risk for chronic mental fatigue and fatigue-related aggression. As a consequence, residents of poor, inner city neighborhoods may have a special need for the mental respite provided by nearby nature.

Kuo and Sullivan, in their 2001 study on aggression and violence in the inner city, aimed to investigate if natural elements such as trees and grass decrease aggression and diminish levels of violence. They conducted structured interviews with 145 female residents in public urban housing, administered attentional performance tests, and collected scores on self-report measures of aggression. The housing project selected for the study provided a rare methodological opportunity for studying the effect of nearby nature since the amount of vegetation in common spaces varies but the demographics and architectural structures were identical throughout the complex. Aerial and ground-level photographs were used to create a greenness measure for each building in the housing project. The greenness scores had a high inter-rater reliability with multiple independent raters. (p. 13)

The results of the study provided strong evidence for nature's potential in reducing aggression and violence. Violence scores were significantly lower for residents living in green conditions than those living in barren conditions. This pattern held for both mild and severe forms of violence. Residents living in green conditions reported using a narrower set of aggressive conflict tactics against their partner over their lifetime than did their counterparts living in barren conditions. The authors cautioned in assuming these effects generalize to other forms of aggression not studied or to aggression in other populations and settings, as this study only examined intra-family aggression by women coping with urban poverty conditions. However, their study does raise questions for further research on the effects of nature on different populations living in different conditions.

Kuo conducted further research in 2001 investigating the outdoor environment impact on individuals' ability to cope with poverty. She theorized that facing and dealing with one's major life issue draws on attentional resources and that attentional fatigue may lead to neglect and ineffectiveness in the management of one's life course; therefore, Kuo specified that more research was needed to determine whether nature's restorative powers extend to the domain of major life-issues management. Residents' attentional capacity, life functioning, and a number of control variables likely to be associated with life functioning were assessed as part of a 45-minute structured interview. Attentional performance and self-reports of effective major issues management were then compared for residents living in buildings with relatively high versus relatively low levels of nearby nature. Overall, the participants' major life issues could be roughly characterized into three themes: coping with poverty, coping with violence, and raising children under these conditions.

Residents living in greener settings demonstrated reliably better performance on measures of attention. The relationship between vegetation and life functioning became non-significant when attention was controlled, and the relationship between attentional performance and life functioning scores remained robust when vegetation was controlled. According to Kuo, in the absence of detectable confounds, Kaplan's (1995) Attention Restoration Theory provides the only ready explanation for these findings. Exposure to nature causes attentional restoration, thereby enhancing life functioning.

Kuo proposes that the findings suggest that the physical environment is an important resource in coping. Research and theory on coping has focused almost exclu-

sively on social support as an external resource for coping, and the research suggests that the physical context matters and points to a possible new focus for intervention efforts. Kuo states the study contributes to understanding of the relationship between humans and the natural environment. In Kuo's own words:

It is striking that the presence of a few trees and some grass outside a 16-story apartment building could have any measurable effect on its inhabitants' functioning. It is all the more surprising that such a modest doses of nature [handful of trees and grass] could enhance an individual's capacity to manage the most important issues in her life, with an effect size comparable to that of major factors such as health and age. Regular contact with nature may be as important to our psychological and social health as the regular consumption of fruit and vegetables is to our physical health. (p. 28-29)

The layout of green zones in cities seems to contribute to creating living conditions conducive to coping and to reducing mental fatigue. Bollens (2006) argues the incorporation of green zones is important when rebuilding cities damaged by war because it provides the physical space necessary for social healing. Research regarding the effects exposure to nature has on the individual will continue to inform the conflict resolution field suggesting unique opportunities to design peace-building and healing spaces in post-conflict zones. In early 2000, the American Friends Service Committee (AFSC) established a series of community gardens throughout Bosnia- Herzegovina with the mission of providing a safe and supportive space where people from different ethnicities could

interact in a non-threatening manner. AFSC project reports (2008) shares stories of the emotional benefits some participants have experienced while being a part of the community gardening project, particularly with those who were afraid of interacting with other people due to trauma they suffered as part of their war experience. Although, as previously noted, nature work cannot be assumed to be a positive experience under all social conditions, the potential for working with nature to heal the emotional impact of war is significant. Not everyone who has survived trauma is ready to process the experience via direct dialog, and providing spaces like community garden creates opportunities for individuals to re-engage with their physical surroundings. Research suggests that nature exposure can offer some coping strategies.

Green zones have also been found to correlate positively with social contact among neighbors (Sullivan, Kuo, & DePooter, 2004), potentially encouraging them to engage with one another in a way that fosters community-building. Community building activities are critical to post-conflict reconstruction efforts, and community building is also needed in many stabilized nations. The Federation of City Farms and Community Gardens (FCFCG) in London, England uses community gardens to help communities meet the needs of and engage with multi-ethnic communities within city neighborhoods. Recent immigrants often experience marginalization, and the gardens provide a social space for them to interact with each other and with other members of the community. The FCFCG works to create culturally sensitive gardens that respect the traditional values of neighborhoods ethnicities. In one neighborhood, women needed to work separately from male gardeners for religious and cultural reasons. The FCFCG instituted a women-only



gardening day to accommodate these needs, and as a result, more women began to participate in the garden. Other gardens provide ethnic minorities the opportunity to grow culturally important food that is either not affordable or not available in the neighborhoods. Many of the community gardens host dinners after the harvests that showcase the foods from the different represented cultures and are open to the entire neighborhood.

Urban green spaces, including parks, common green spaces, and community gardens have been linked to stronger ties to neighbors (Kuo, Sullivan, Coley, & Brunson, 1998) and help older adults to integrate into social networks in the inner city (Kweon, Sullivan, & Wiley, 1998). Community gardens bring residents together into a denser network than their urban roles normally allow. (Glover, 2003)

Community gardens build social capital, which Foster (2006) explains as “the ways in which individuals and communities create trust, maintain social networks, and establish norms that enable participants to act cooperatively toward the pursuit of shared goals.” She notes that scholars such as urban sociologist William Julius Wilson have argued that a lack of social capital can make communities vulnerable to many problems of urbanization. Recently, Tidball and Krasny (2007) proposed that urban community gardens build resilient urban communities that are able to handle natural disasters and human-made conflicts more effectively.

Saldivar-Tanaka & Krasny (2004) conducted research on Latino community gardens in New York City. The authors conducted extensive interviews with gardeners and surrounding community members and found that the gardens, in addition to being sites for growing food and flowers, were most often seen as cultural and social neighborhood

centers where people went to meet with friends, family, neighbors, newcomers, and visitors. People of all ages got together, sometimes on a daily basis to play, relax, exercise, cook and share food, chat, and find out what is going on in the community. The gardens provided opportunities for daily socializing and a gathering place for special events and celebrations. The researched community gardens provided a place for social interactions that were previously missing from the neighborhoods.

Urban community gardens, however, can become politically contested spaces in and of themselves and are susceptible to different types of conflict. Schmelzkopf (1996) examined community gardens in the Loisaida part of Lower East Side Manhattan, New York City. The sample included 75 gardens in an area that is crime ridden and where most of the residents are poor. The gardens provide safe open spaces for socialization and local food production for the neighborhood. Within Loisaida, several of the large gardens became politically contested spaces when conflicting community needs led to dilemmas of whether to develop the land for low-income and market-rate housing or to preserve the gardens. Many people who were active in the housing-advocacy groups were also community gardeners or previous garden supporters. A community conflict was developing over the issue of saving the gardens. A preservation project devised a plan that used open spaces for construction without using any of the garden sites. Had the preservation project not been introduced early in the development process, the ensuing community conflict could have resulted not only in the demise of the gardens but in the loss of social relationships that had been built amongst the gardeners and between the gardeners and the surrounding community.

The success of most community gardens requires the combined efforts of resident gardeners, technical-support organizations, and in the case of city-lease gardens, city agencies. Issues of neighborhood development and land tenure can create serious tensions within neighborhood. Gardens are not created outside of social and political contexts. Gardens can be subjected to bureaucratic limitations and regulations, particularly when they are constructed on city-owned land or supported by city funds.

Operation Green Thumb (OGT) is a New York city supported program dedicated to supporting existing gardens rather than building new ones. It is one of the few and the largest city-run gardening program in the United States. OGT-supported gardens must have a publicly accessible entrance and must be open to the public at least once a week, with hours posted on the front gate. Public access to the gardens is often a source of contention for non-gardening members of the community. Requiring legal access to the gardens does not necessarily mean that the sites are welcoming public spaces during open hours. Fences, locks, posted hours, and lists of rules and regulations on garden gates, as well as an often close-knit interaction among some gardeners, can cause confusion in the neighborhoods as to whether the gardens are, in fact, private or public. Some gardeners insist that these are protective devices used solely to keep criminals out of the gardens, while others acknowledge some exclusionary tendencies but feel justified because they have worked so hard in creating and maintaining the gardens. (Schmelzkopf, 1996)

Environmental conflict resolution practitioners have the opportunity to facilitate land tenure conflicts during the establishment of gardens and can help facilitate community meetings to ensure that the gardens are indeed serving all members of the com-

munity. Thriving community gardens should be researched to assess their impact on the immediate community but also to understand the impact that it has on surrounding neighborhoods. Gardens, particularly ones located in urban food deserts, have the potential to create competition and resentment between neighborhoods. The literature on community gardens supports the multiple benefits of gardens: increased food security and nutrition, economic benefits for participants and local communities, and community development, but research into the benefits must also include research into secondary problems created by gardens and conflicts experienced within gardens. According to Schmelzkopf,

Gardeners often complain about interactions in some of the gardens, which they call garden politics. The practice includes anything from the not-uncommon power struggles and backbiting of any organization or family structure, to disturbing conflicts about different ethnic and gender backgrounds—who should grow what, why certain behaviors are preferred over others, who belongs, and who does not (1996, p.376).

Even though the gardens have the potential for internal and inter-group conflict, Schmelzkopf writes,

[Community gardens] share the common experience of carving out contested spaces in the large structures of economic and political power. At issue are important questions about who has the right of access to space and nature and what price society is willing to pay to maintain the spaces. (p. 380)

A measure of the success of garden community building is not that conflict is absent from the gardens entirely but that it is rather due to the relationships and commitment to community that the conflicts are resolved in a manner that is peaceful and relationship sustaining. Research comparing community gardens that practice permaculture with community gardens that do not may reveal different garden politics and conflict resolution approaches within gardens. The research for this dissertation provides initial support for permaculture practice supporting a holistic problem-solving approach to conflicts and challenges. Comparative research between permaculture and non-permaculture gardens from a variety of social contexts will greatly enhance the developing literature on environmental community and peacebuilding.

The American Gardening Association (2008) identified the need for further research on the contribution of community gardening to building social cohesiveness. The research needed to understand community gardens parallels future research needs for the development of permaculture in peace-building efforts. They identified a need for research and documentation on the group and neighborhood benefits of community gardening overall. Specifically, the American Gardening Association identified a need for research on community garden's impact on group identity, gardens as a meeting place for different cultural groups, cultural differences in garden use, defining "community" in community gardening, contribution of gardens in building social cohesiveness, and community gardens as settings to expose and resolve social conflict (p.3).

The research presented in this dissertation's fieldwork indicates that permaculture contributes to building social capital and that permaculture practitioners handle challen-

ges in a holistic manner that appears to be based upon the integration of the permaculture ethics and design principles into their daily lives. According to the interviewees, practicing permaculture has impacted their individual lives positively and facilitated community building within and between practicing communities. Further research is needed into the specific dynamics and mechanisms by which permaculture and nature works operate.

The theory of permaculture as peacebuilding developed through this research is most relevant for the Salvadoran context. The generalizability of the theory beyond El Salvador, the conflict history, and the social conditions of that country have yet to be determined. Future research should focus on permaculture's role as peacebuilding after conflicts where land tenure is not a predominant cause of the armed struggle. Permaculture in El Salvador had a secondary role in ex-combatant reintegration; however, the combatants came from primarily rural agricultural communities, and it is not clear if permaculture would function in the same way in a different conflict context. For example, permaculture may function differently in an ethnic or cultural conflict that is perpetuated by urban dwellers for religious reasons.

Permaculture was a culturally appropriate peacebuilding intervention for rural subsistence farmers, and future research should explore the power of permaculture among different populations in different stages of peacebuilding. In El Salvador, the MAOES organization recently began teaching an urban permaculture design course. MAOES reports that the course has been received with much enthusiasm in the capital city of San Salvador, and the inaugural cohort has begun implementing permaculture practices. MAOES also reports that there is already a waiting list of people who want to take the

design course the next time it is offered. The development of urban permaculture in El Salvador provides an exciting opportunity to compare the permaculture experiences of urban dwellers and rural subsistence farmers within the same conflict context and to examine how permaculture impacts the environmental challenges present in urban zones. The MAOES urban permaculture courses also provide a research opportunity to investigate permaculture practitioners in the same conflict context that are not associated with IPES in order to evaluate the differences in training approaches, which may impact the role of permaculture within the lives of individuals and their communities.

Permaculture practice began to take root in El Salvador shortly after Juan Rojas returned to the country after the war and began collaborating with the local farmer-to-farmer movement. The process of creating a formal permaculture institute took time, and it was not until the year 2000, eight years after the peace accord was signed, that formal permaculture training commenced. The distance of time from the immediate post-conflict stage to the transitional post-conflict stage could impact the permaculture personal integration process. The delay in the introduction of permaculture training may have made it more attractive to potential permaculture practitioners because people had time to process the conflict events and could focus upon future-oriented activities. The years prior to the introduction of formal permaculture may have created an awareness of the long-term environmental impacts of the war and the need to engage in rehabilitating the damaged ecosystems. Most people would expect the visible fire and bomb environmental damage to impact their lives in the year or two immediately after the conflict. However, the environmental damage to the ecosystems in El Salvador did not self-correct, and the

impacts to the soil and water are still being felt years after the official conflict ended. The introduction of permaculture later in the peacebuilding process may positively influence interest in participating in environmental restoration activities.

The permaculture movement is gaining attention and momentum worldwide as a local solution to global environmental challenges. The Permaculture Research Institute (PRI) located in Australia is currently organizing the creation of a worldwide network of permaculture demonstration sites and teaching centers, some of which are located in conflict zones, to facilitate research into the application of permaculture to serious structural and environmental challenges. The development of such a network will facilitate the opportunity for conflict resolution practitioners to study permaculture in various contexts around the globe and to continue developing permaculture as a peacebuilding theory.

The research presented in this dissertation provides clear support for the framing of permaculture as peacebuilding and opens the possibility to create relationships between conflict resolution theory and practice and environmental work. Perhaps not all of the world's problems can be solved in a single garden, but permaculture provides an analysis process and practice that effects the environment and helps build peace-oriented social structures.



## **Appendix A: Interview Schedule**

How would you describe your town/village?

How long have you lived here?

Have you always lived here?

How did you come to live here?

Have you ever left?

If so, what motivated you to return?

What initially motivated you to become involved in a permaculture project?

What aspects of the project are you/were you involved with?

- At home
- In the larger community

Do you have a Permaculture Design Certificate?

- Do you want to study to get one
- Do you want more training in any specific area, topic, or skill

How have you learned the skills to participate in the project?

Were you always involved in cultivating land?

Has your family historically been cultivators of land?

Did you already know some of the methods taught in the project?

- If so, where did you learn them

How has the town changed during your time here?

Have you noticed any changes in the soil, water, overall nature conditions in the past?

- 15 years
- 10 years
- 5 years
- 2 years
- This past year

- If so, how have you dealt with or worked through these changes?

Do you have a home garden?

What do you grow?

Are you using different techniques than you previously used?

Do you have larger variety of food in your diet since participating in the project?

Is the quality of the what you grow different?

What are your other sources of food?

Have you shared anything that you have grown in your garden with anyone else?

Have you shared anything you have learned from the project with anyone else?

Have your motivations to participate in permaculture projects changed over time?

If so, could you please explain how they have changed?

In your opinion, what are the greatest challenges to the project?

- For you personally
- As a community

Have you experienced any specific difficulties or problems in either your work or the larger community project?

- If so, how were they handled?

What does the idea of community mean to you?

In your opinion, what are the most important aspects of community?

Has your participation in the permaculture projects changed your perception of community?

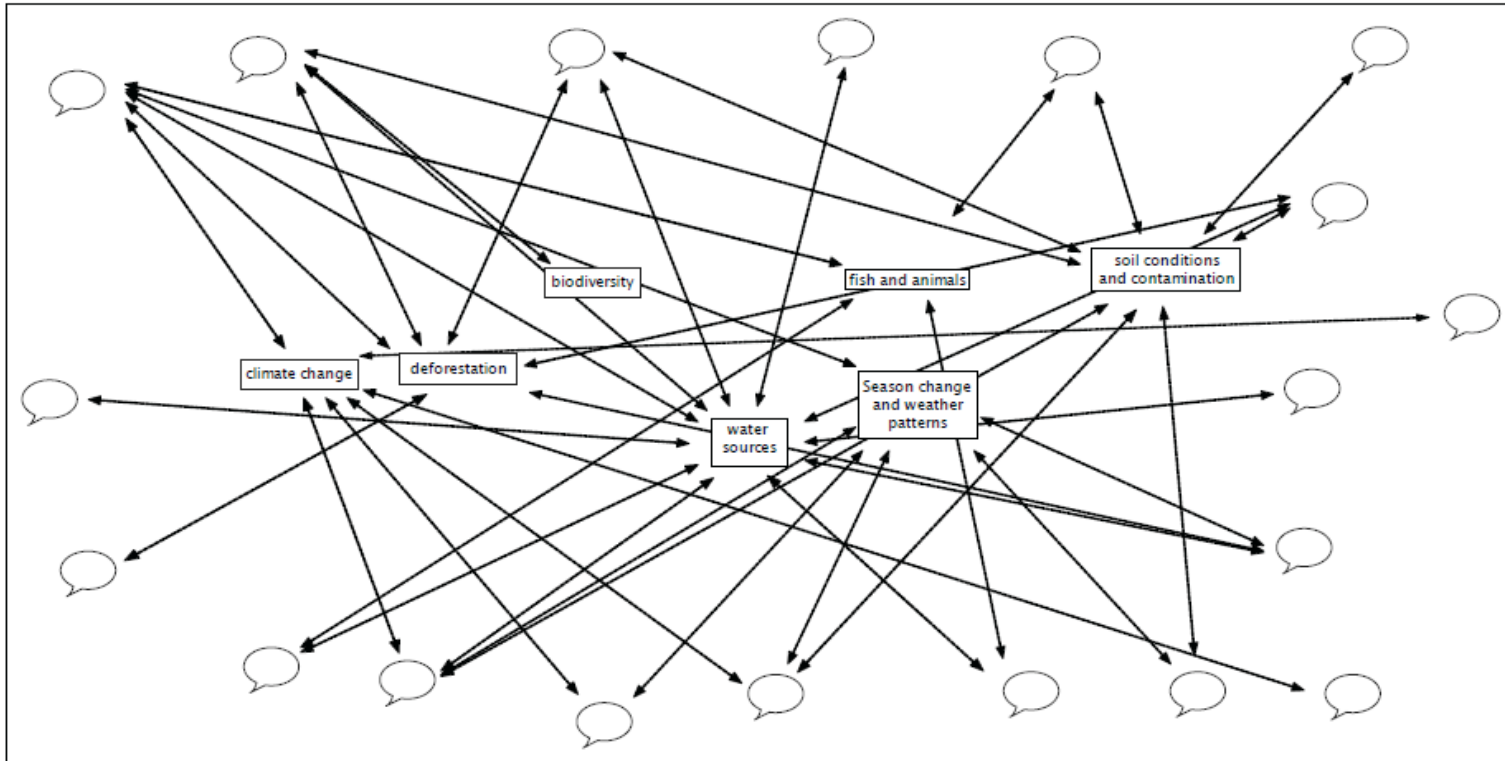
What future do you envision for the projects?

What future do you envision for your community?

Where do you see your personal involvement with this work in the future?

Has getting involved in permaculture had a personal impact on you?

## Appendix B

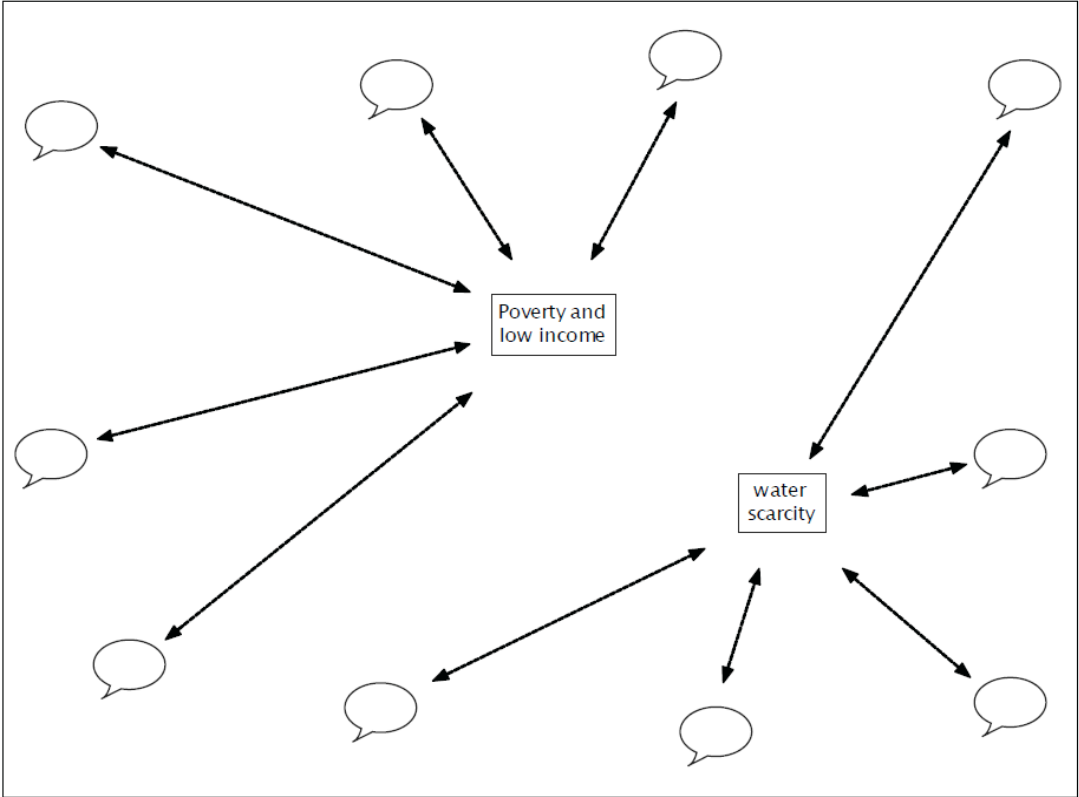


209


**Figure 3.** Interview data coded to environmental conditions organized by prominent themes

☞ = individual quote from interview

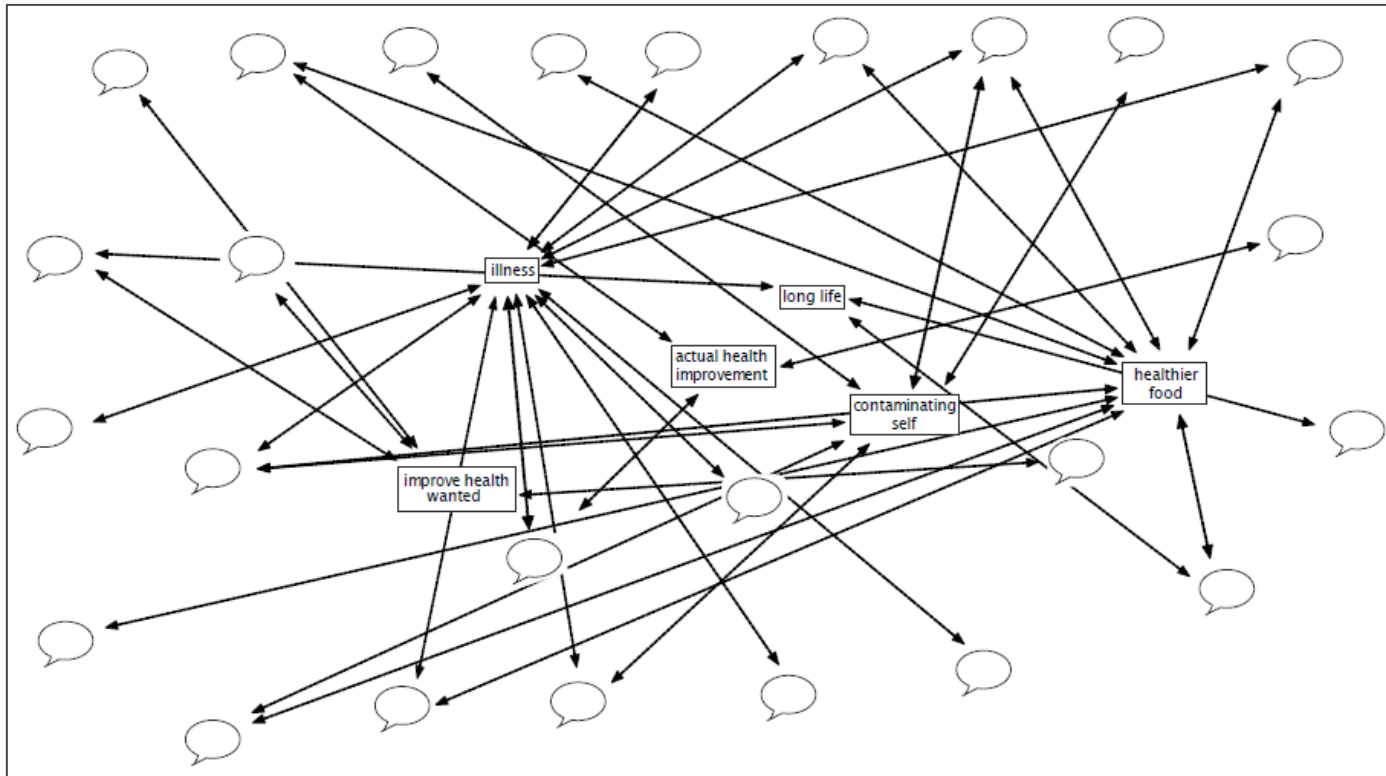
# Appendix C



**Figure 4.** Interview data coded to living conditions organized by prominent themes

 = individual quote from interview

## Appendix D

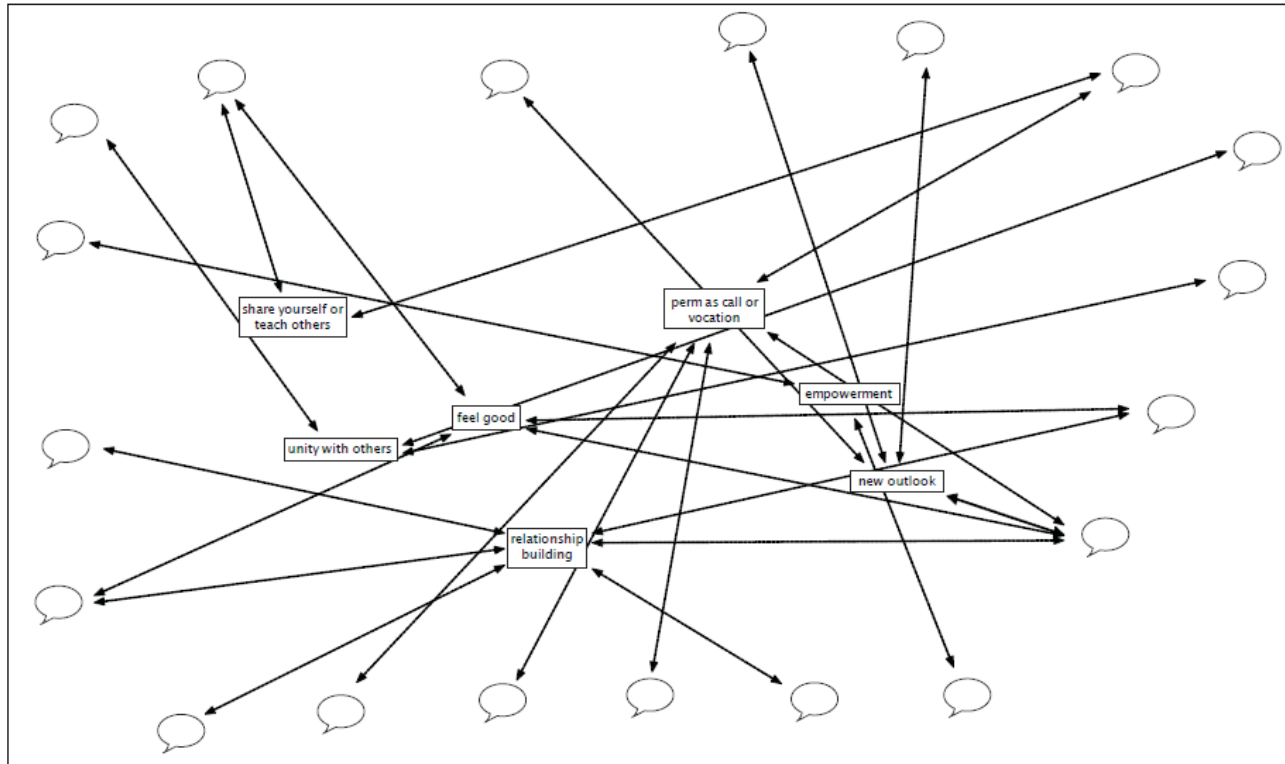


212

**Figure 5.** Interview data coded to health organized by prominent themes

☞ = individual quote from interview

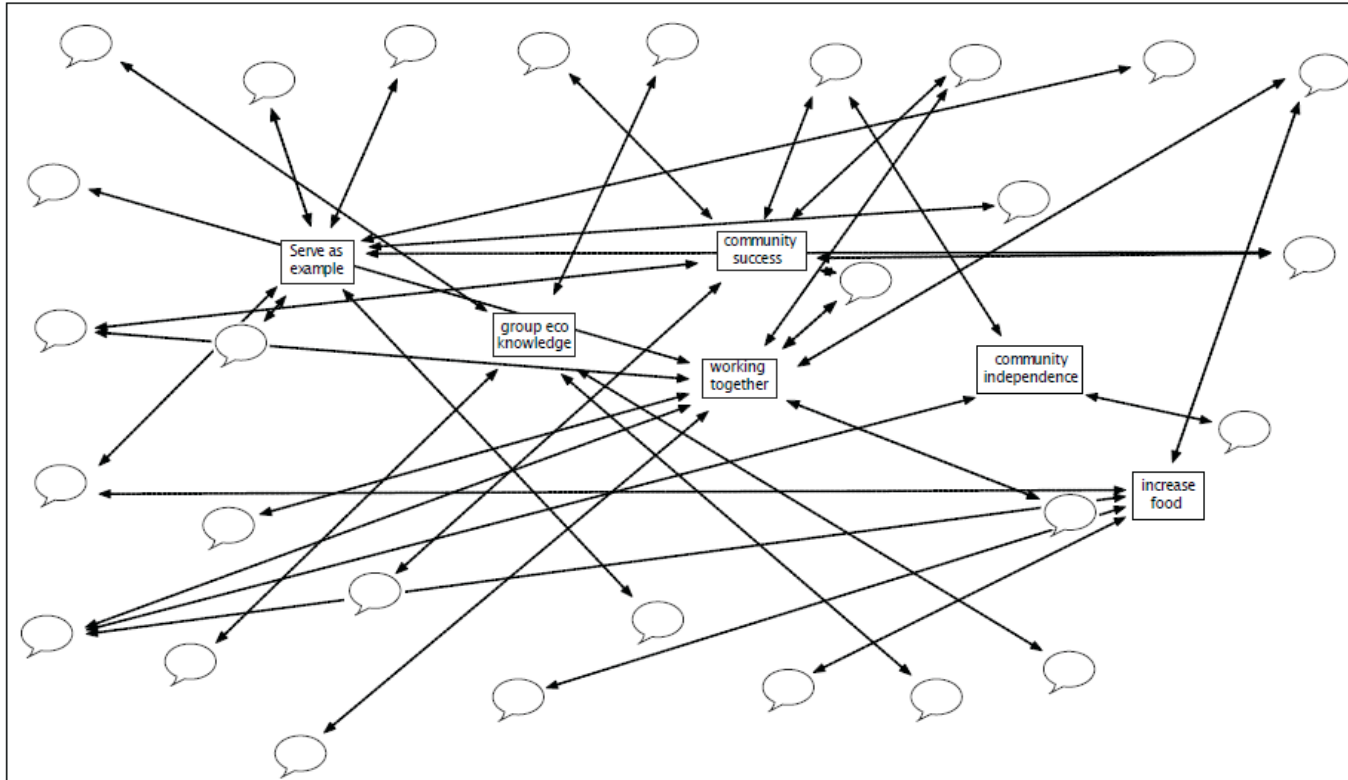
## Appendix E



**Figure 6.** Interview data coded to permaculture personal impact organized by prominent themes

☞ = individual quote from interview

## Appendix F



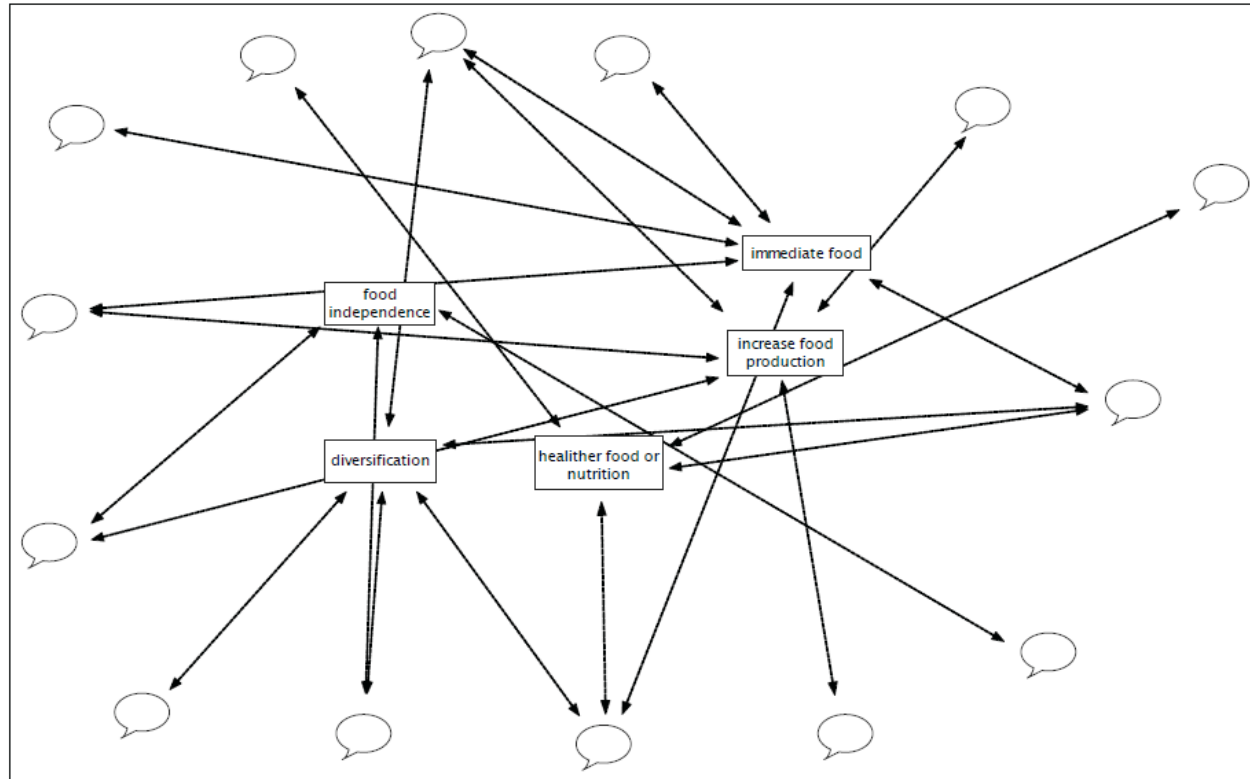
214

**Figure 7.** Interview data coded by permaculture impact on community organized by prominent themes

☞ = individual quote from interview



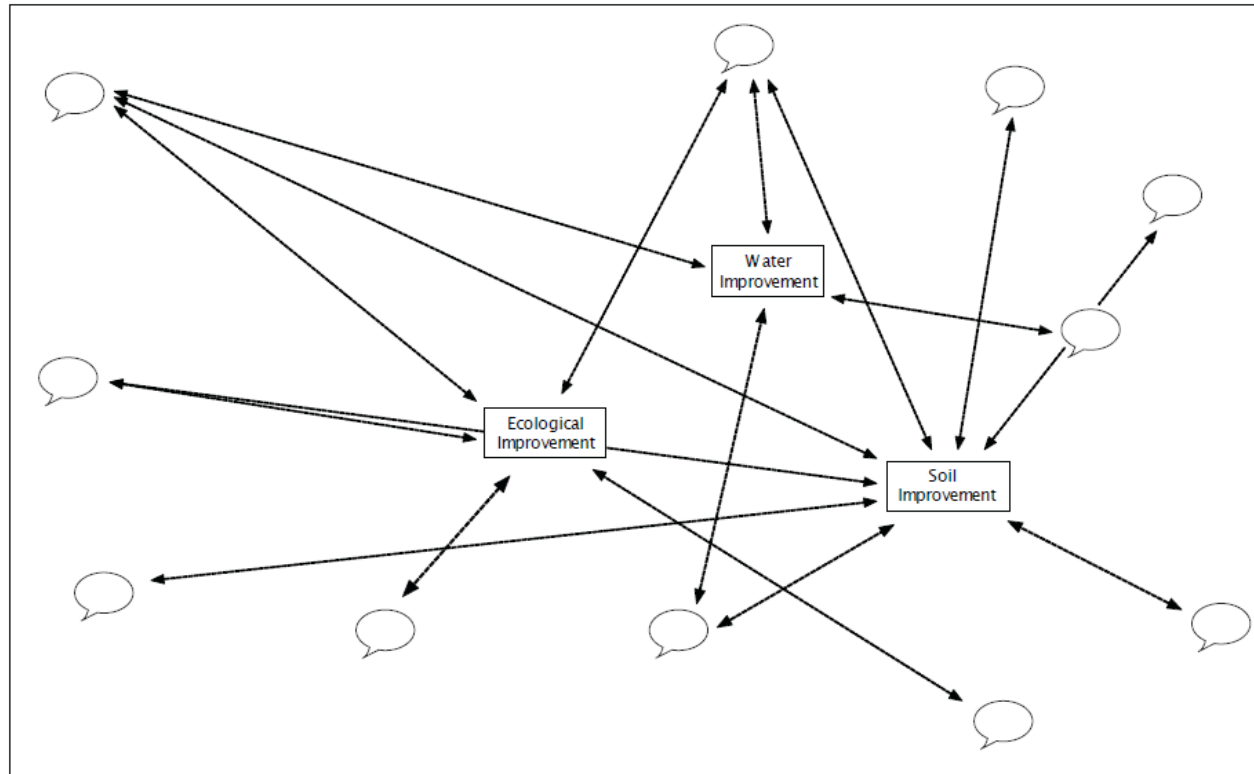
## Appendix G



**Figure 8.** Interview coded to food security organized by prominent themes

☞ = individual quote from interview

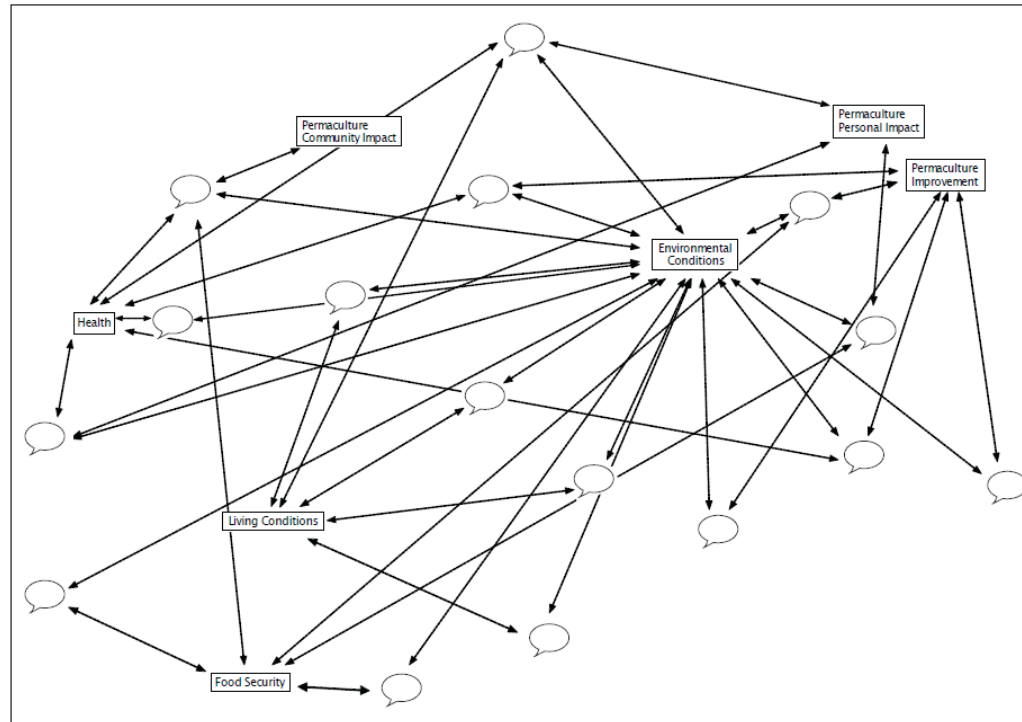
## Appendix H



**Figure 9.** Interview data coded to permaculture improvement organized by prominent themes

☞ = individual quote from interview

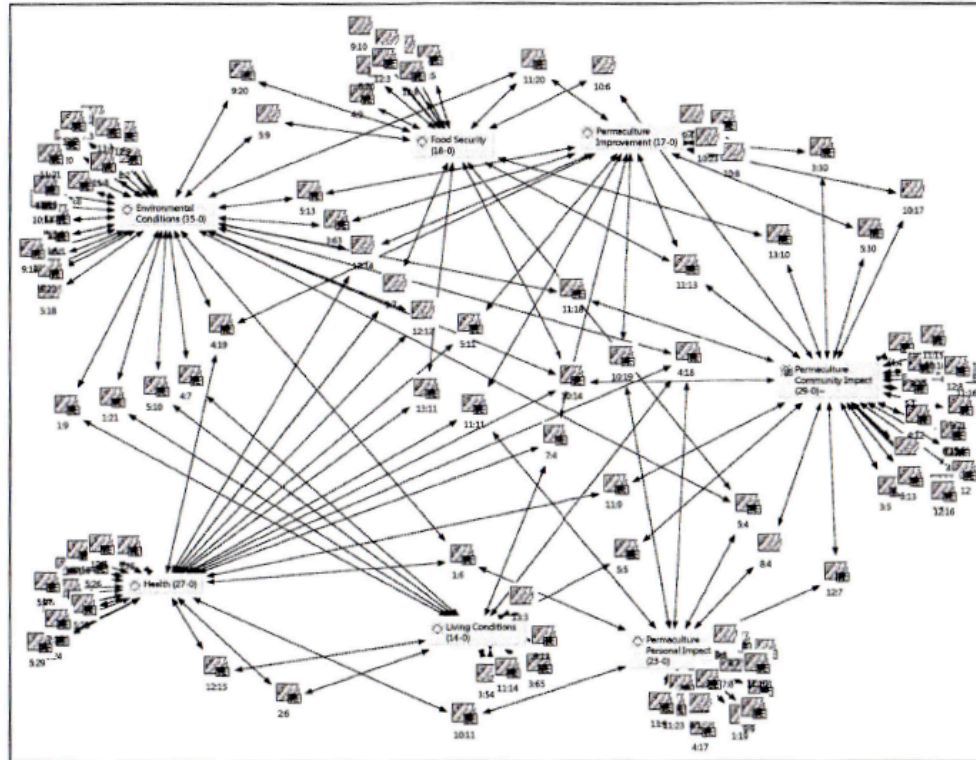
## Appendix Ia



**Figure 10.** Network view of co-occurrence between seven life domains. Non co-occurring quotes have been removed from this view. To view the complete network, please see Appendix Ib

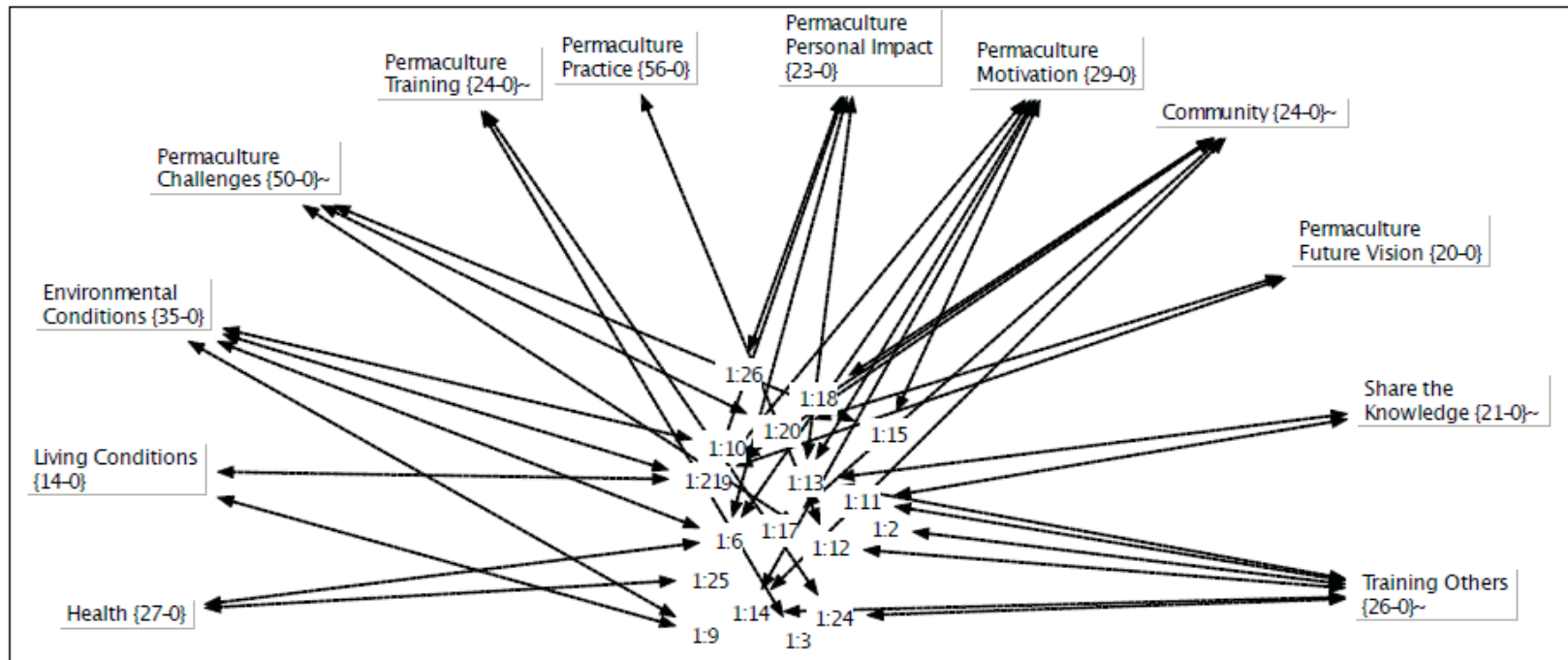
☞ = individual quote from interview

## Appendix Ib



**Figure 11.** Network view of all interview quotes coded to seven life domains. This network shows the overall map of the quotes coded to each life domain and the co-occurrence between domains. See Appendix Ia for a view of network with non co-occurring quotes removed

## Appendix J



**Figure 12.** Code map of Oscar's interview

## Appendix K

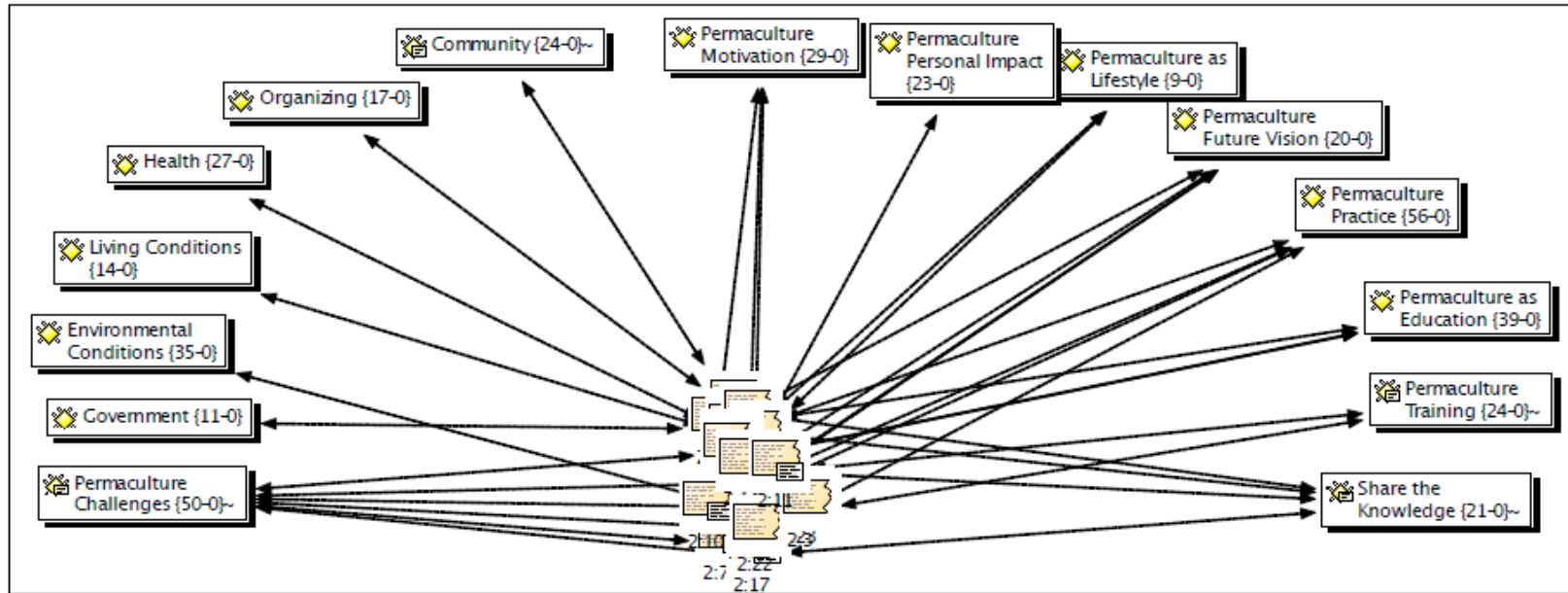
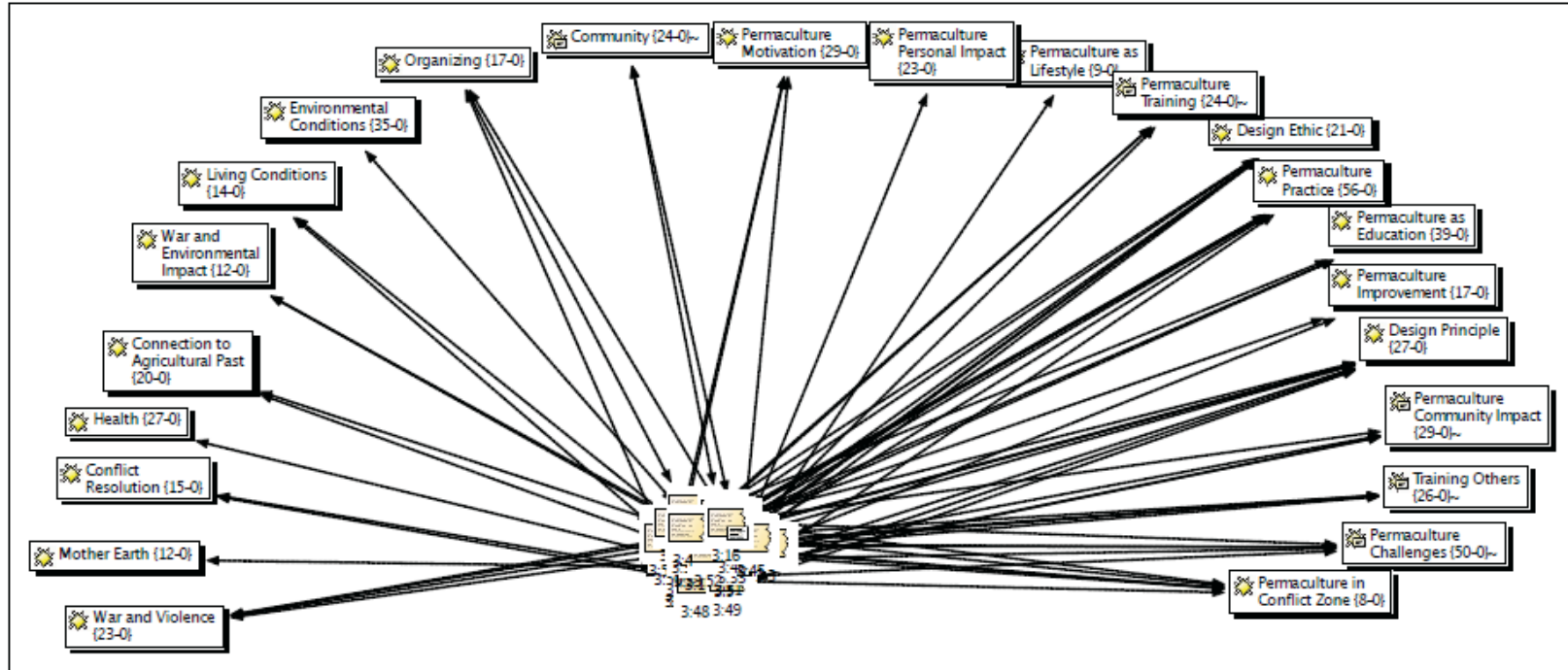


Figure 13. Code map of Tomas' interview

## Appendix L



**Figure 14.** Code map of Miguel's interview

## Appendix M

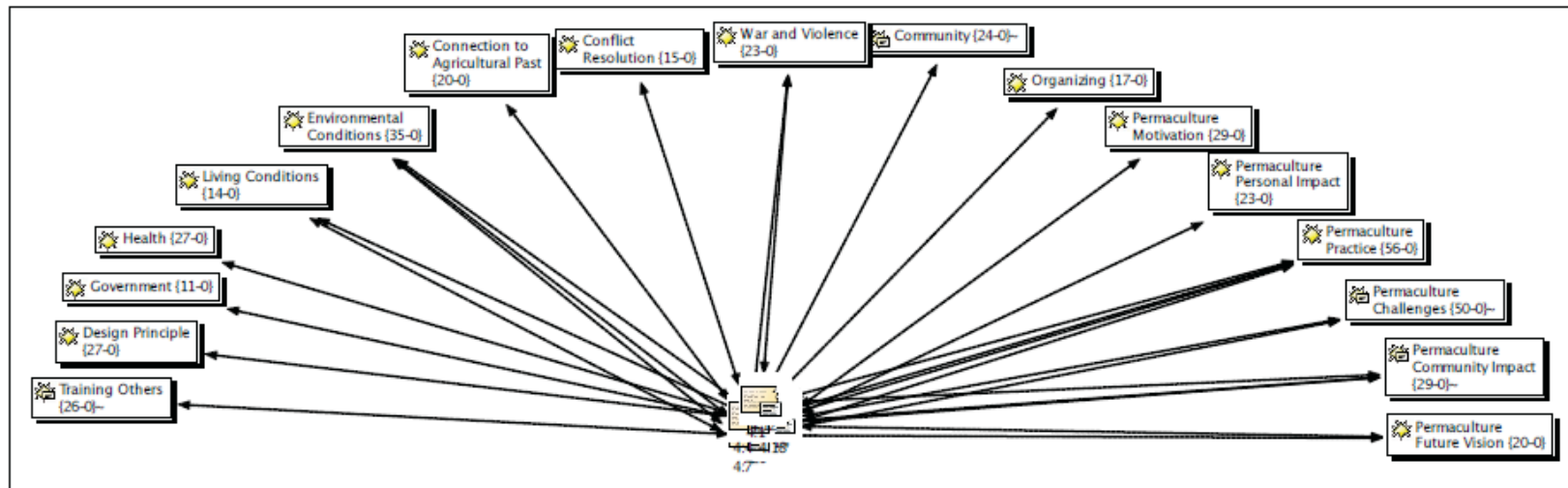


Figure 15. Code map of Elesseo's interview



## Appendix N

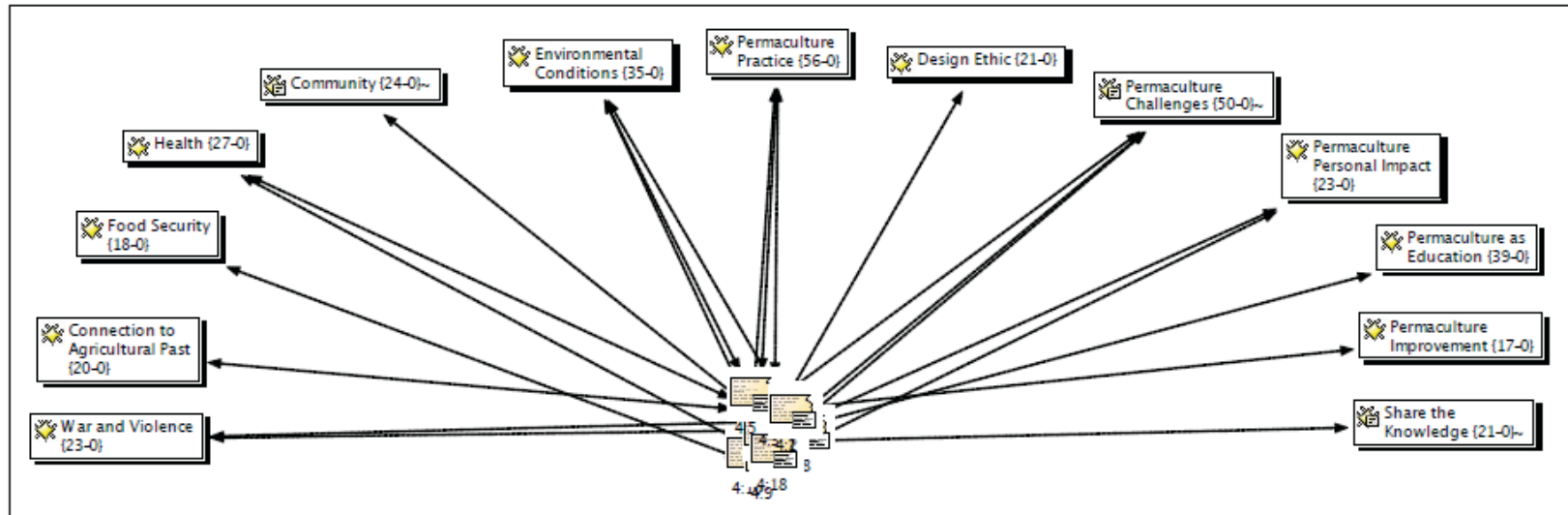


Figure 16. Code map of Alejandro's interview

## Appendix O

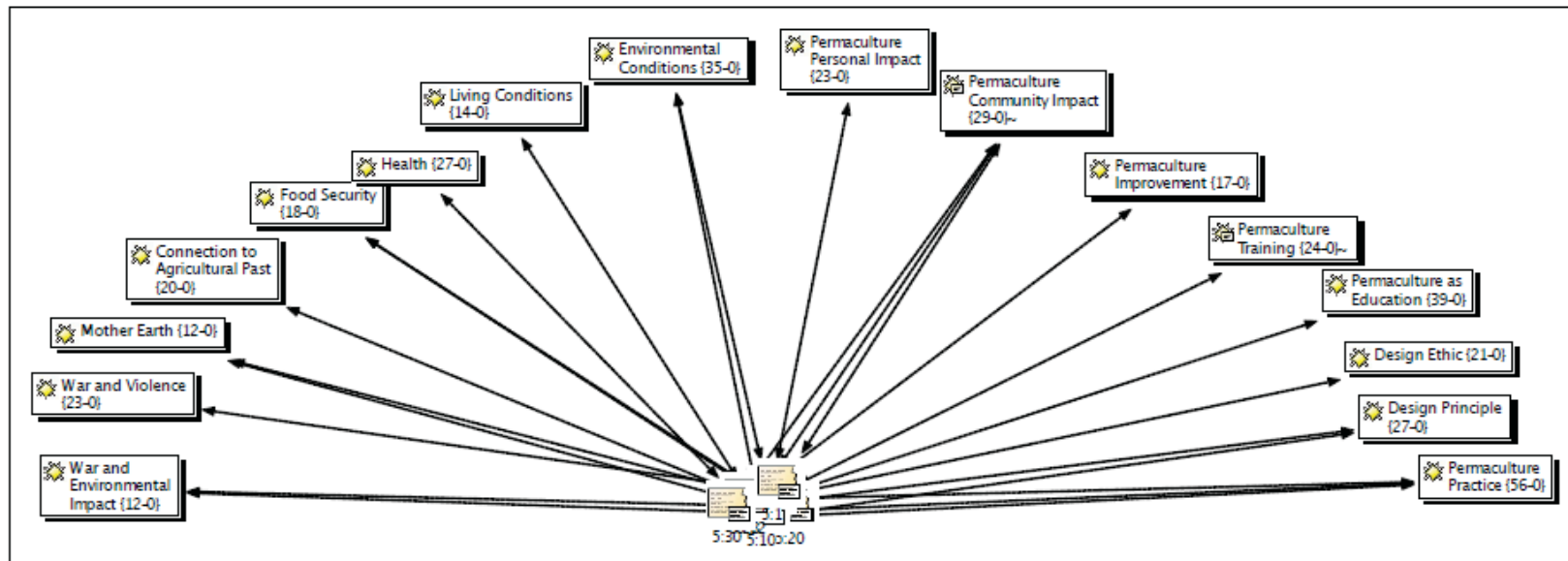


Figure 17. Code map of Angelica's interview

## Appendix P

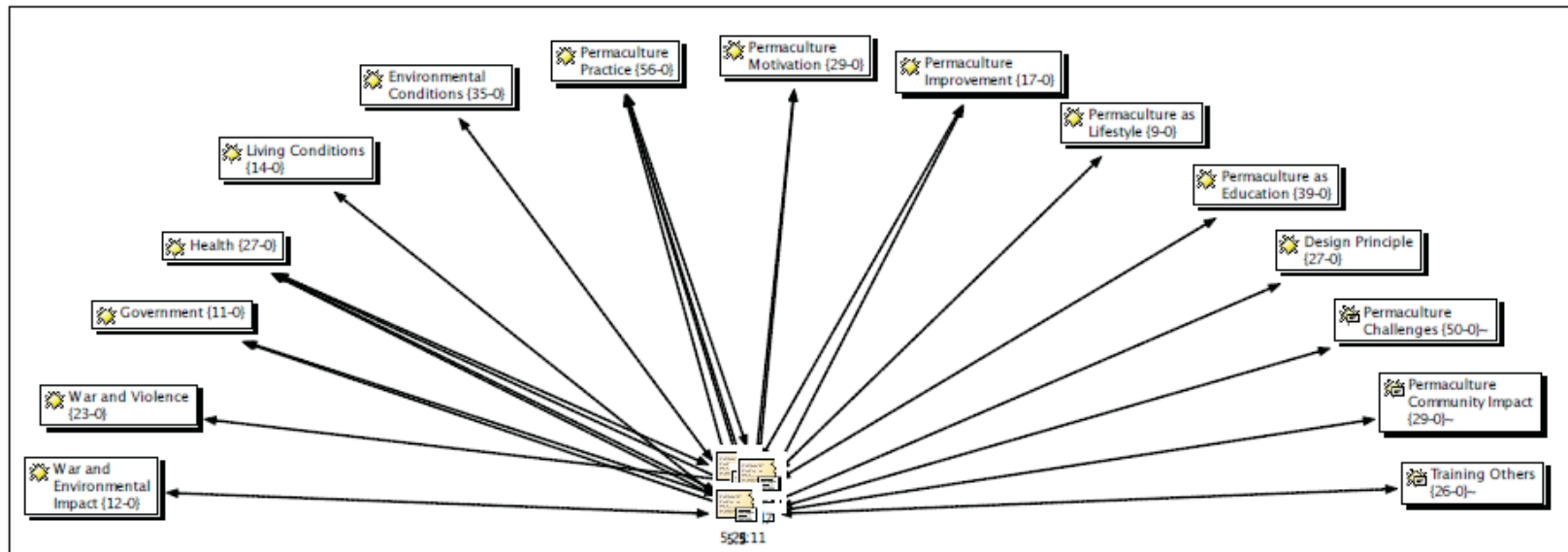


Figure 18. Code map of Isabel's interview

## Appendix Q

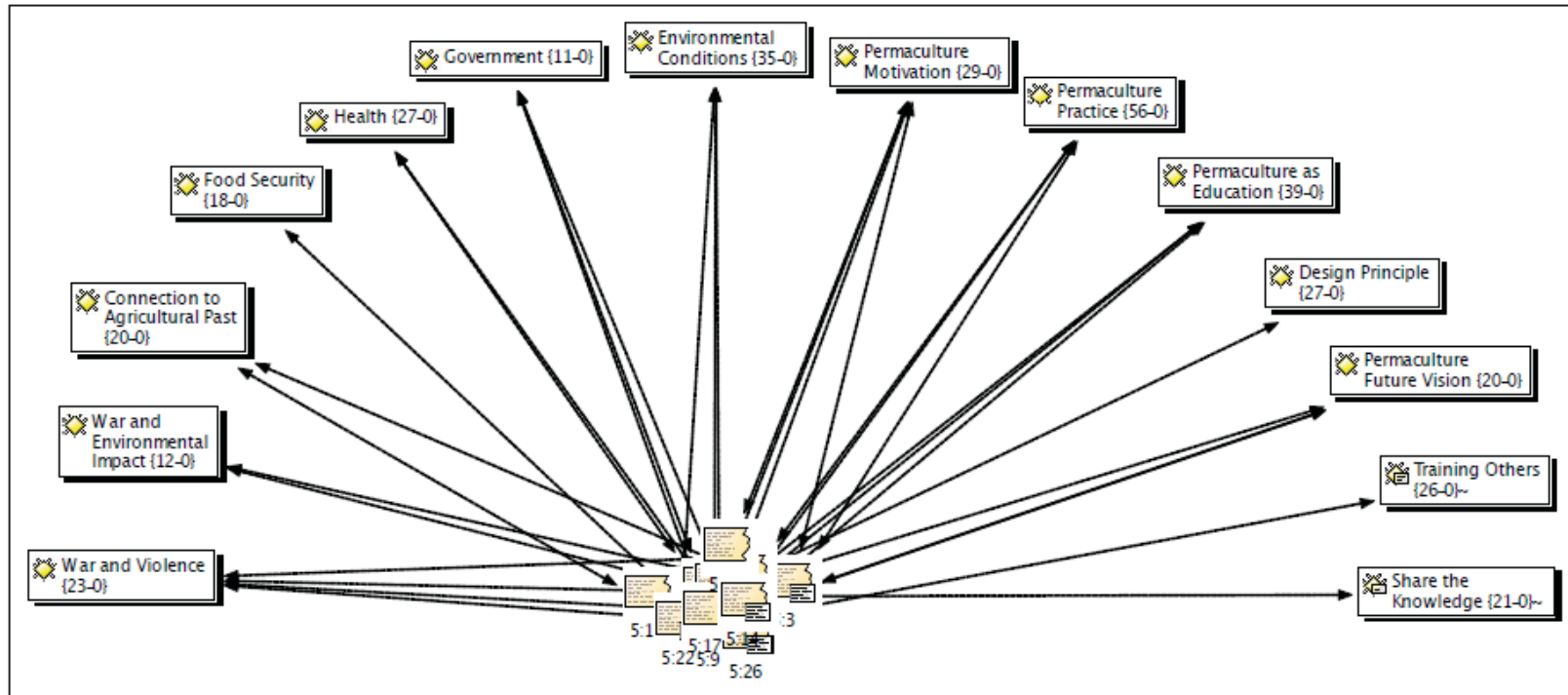


Figure 19. Code map of Paco's interview

## Appendix R

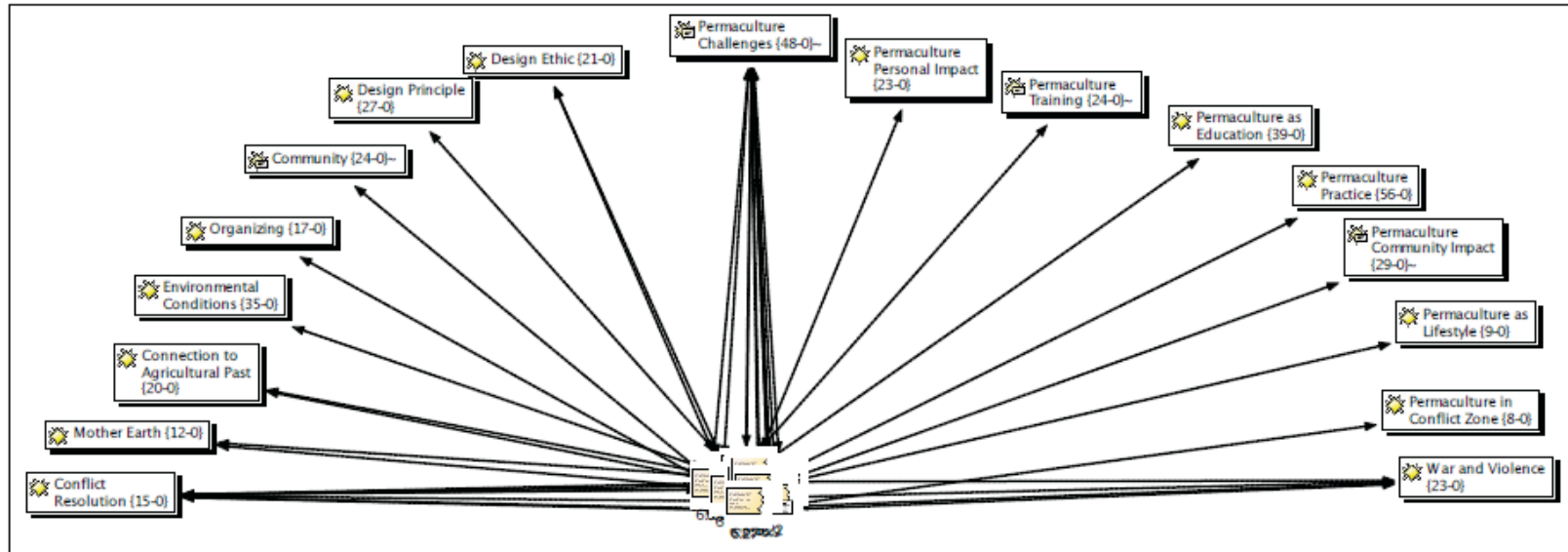


Figure 20. Code map of Karen's interview

## Appendix S

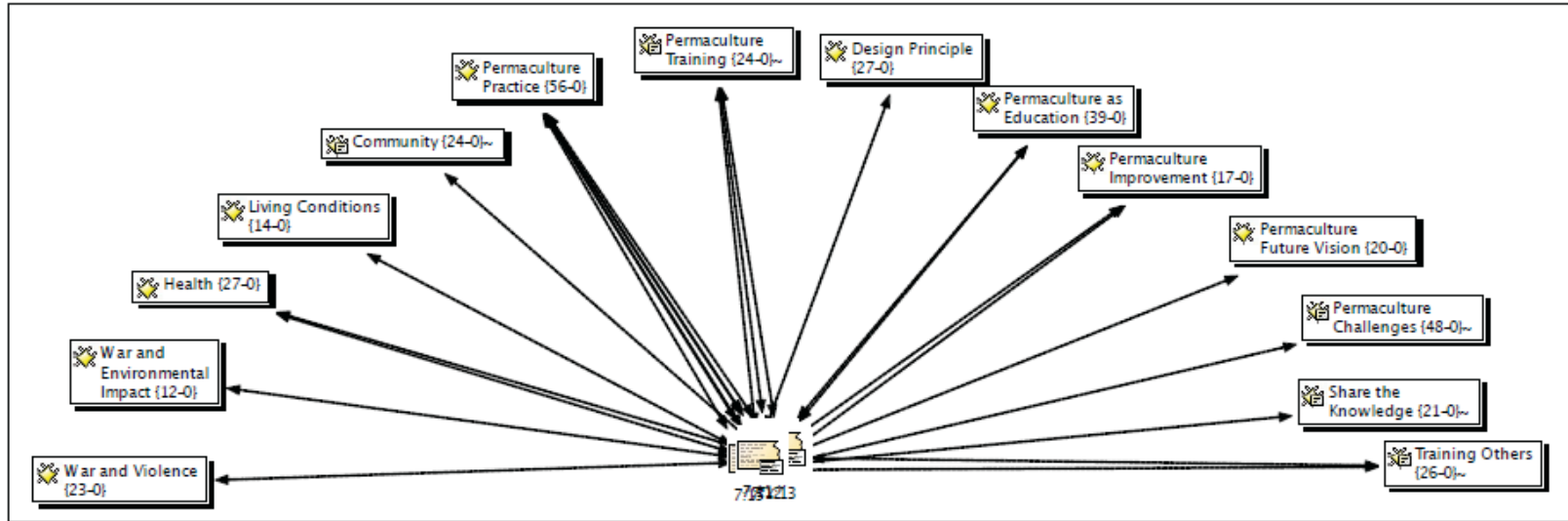


Figure 21. Code map of Carmen's interview

## Appendix T

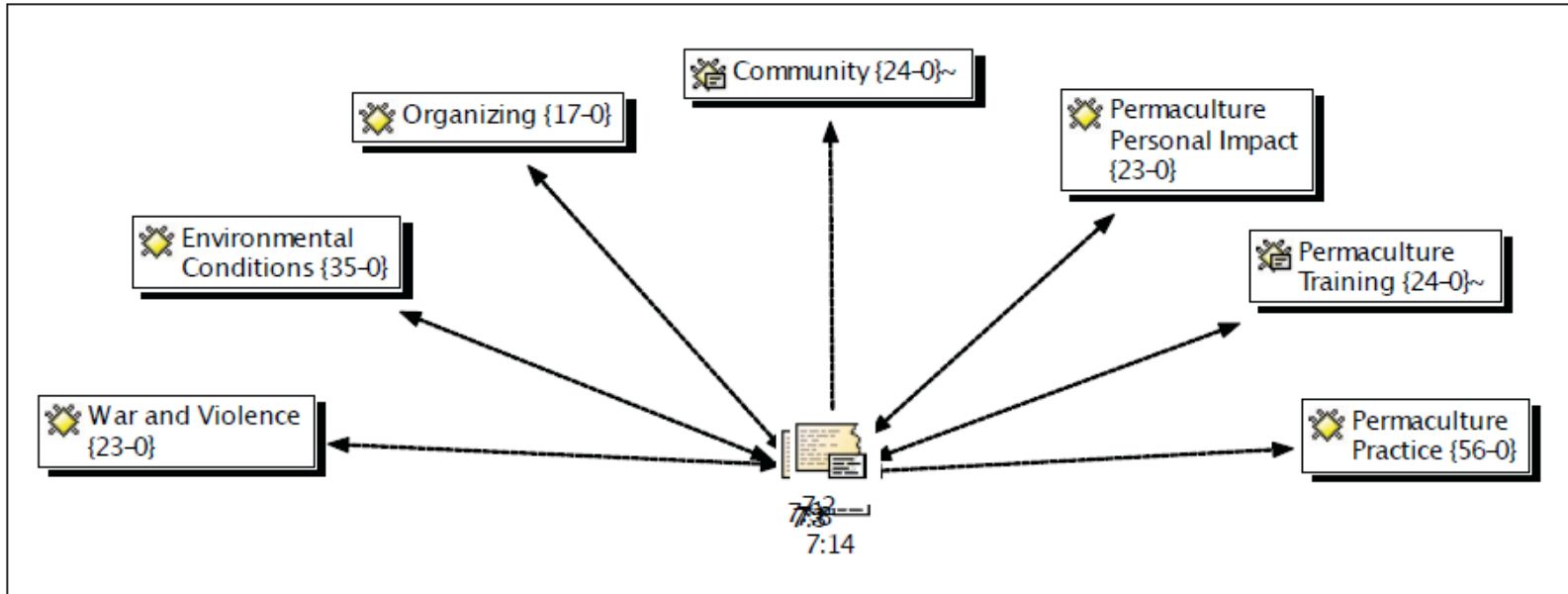


Figure 22. Code map of Fermin's interview

## Appendix U

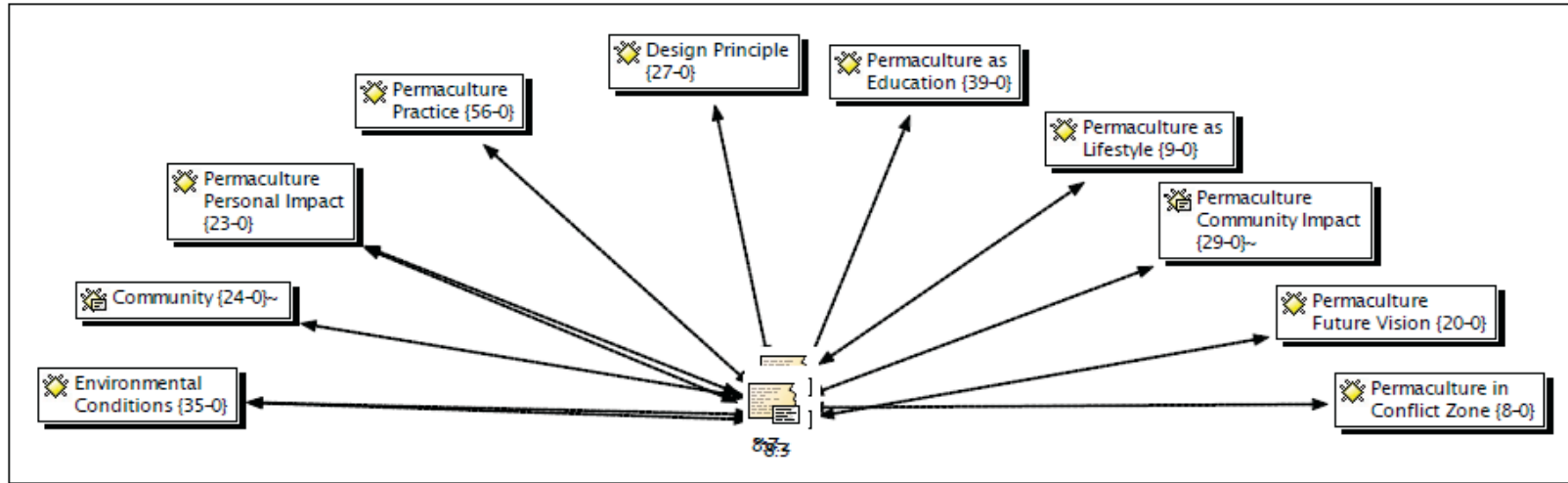


Figure 23. Code map of Elizabeth's interview



## Appendix V

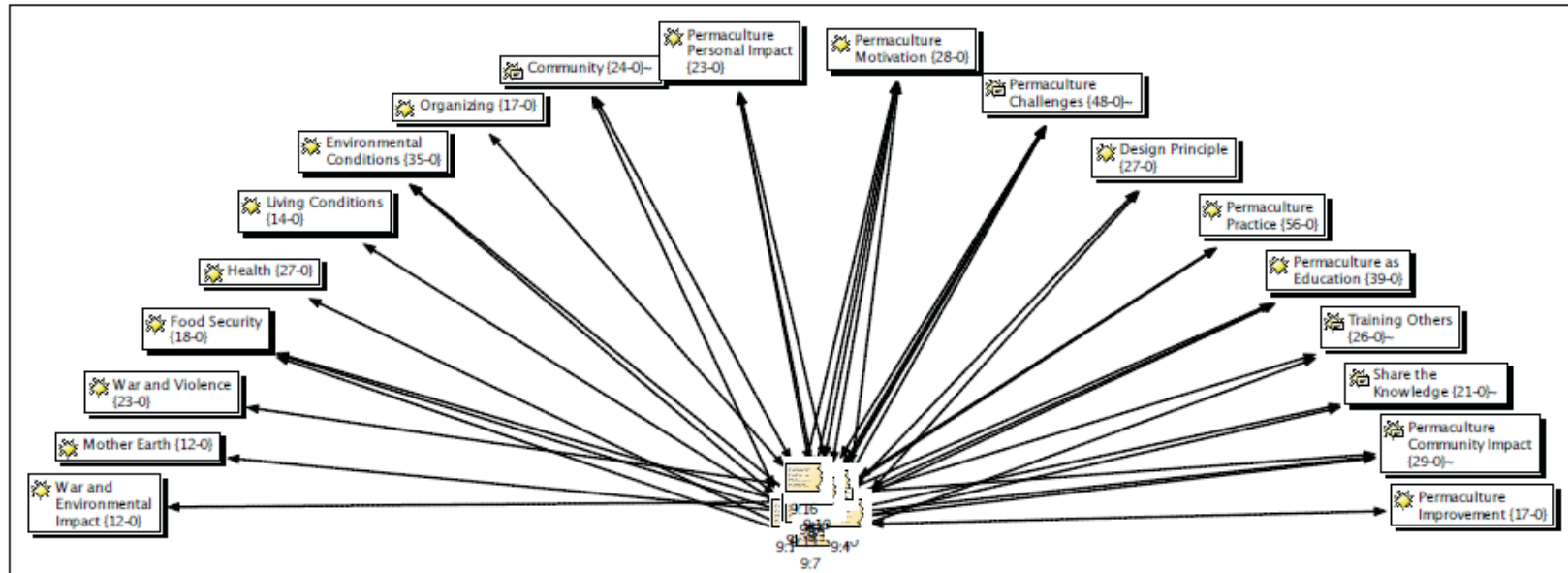


Figure 24. Code map of Reina's interview

## Appendix W

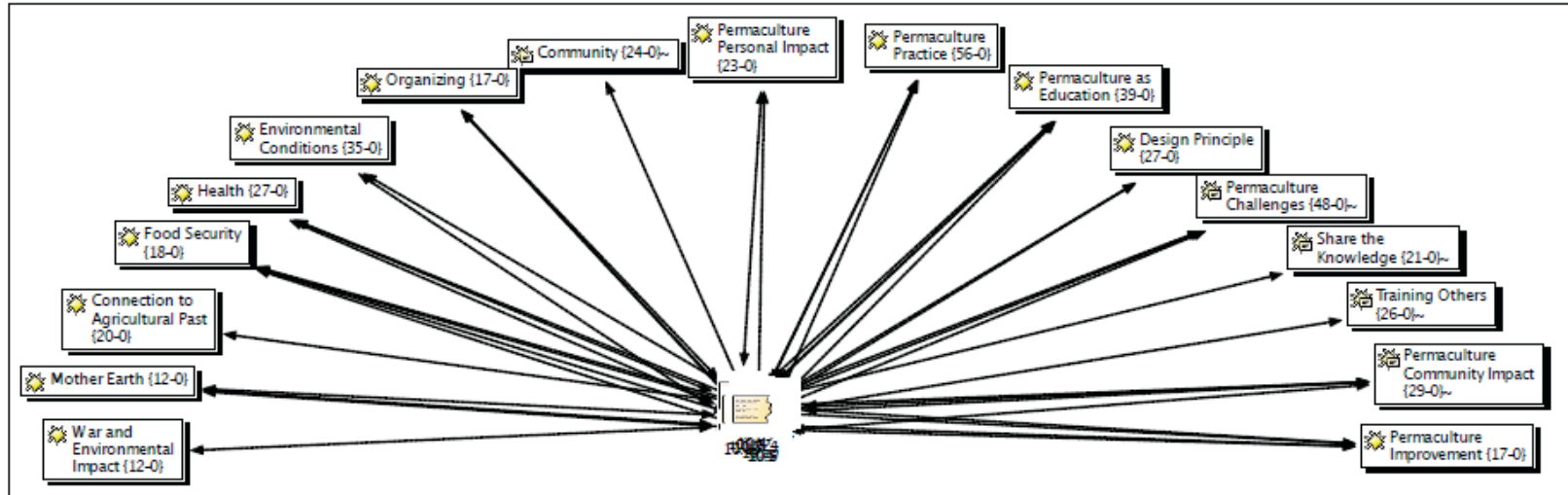


Figure 25. Code map of Noemi's interview

## Appendix X

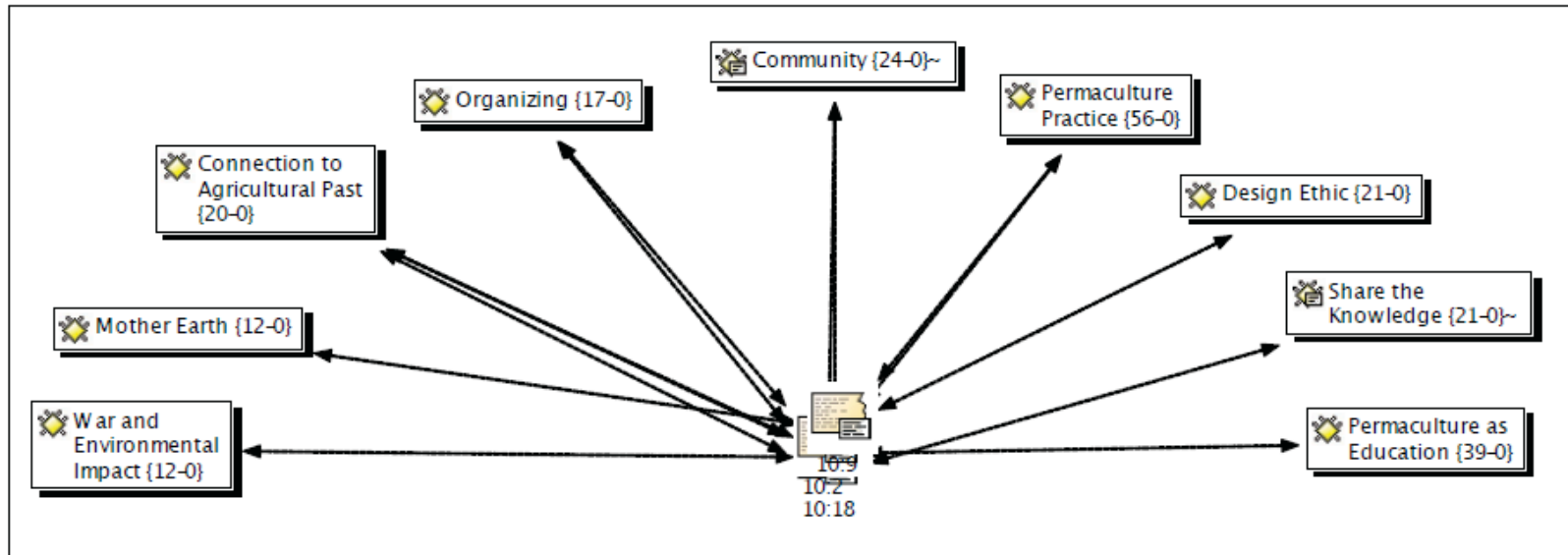
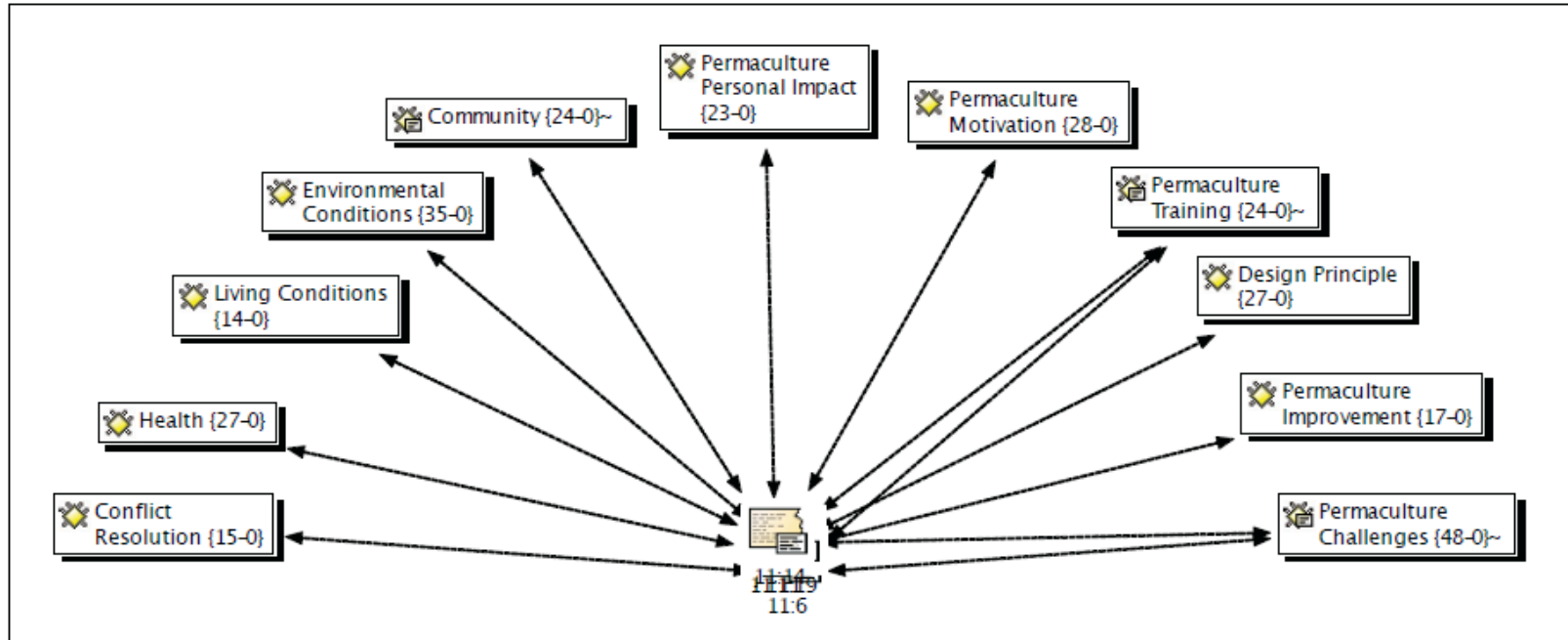


Figure 26. Code map of Gertudis' interview

## Appendix Y



234

Figure 27. Code map of Valentin's interview

## Appendix Z

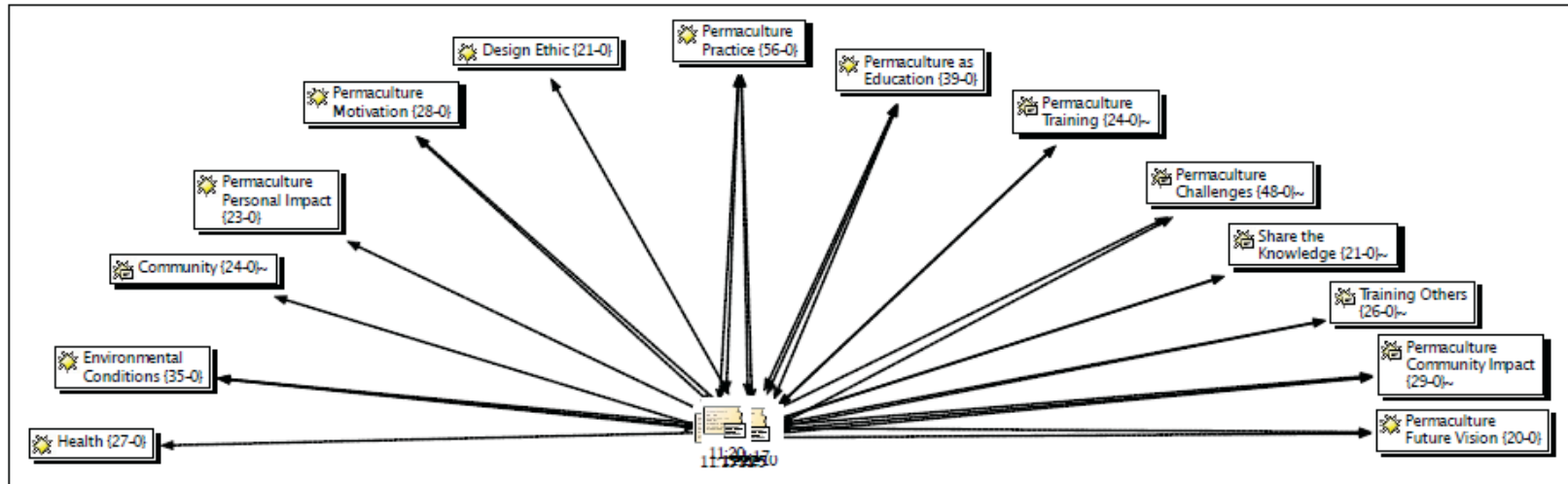


Figure 28. Code map of Norma's interview

## Appendix 1

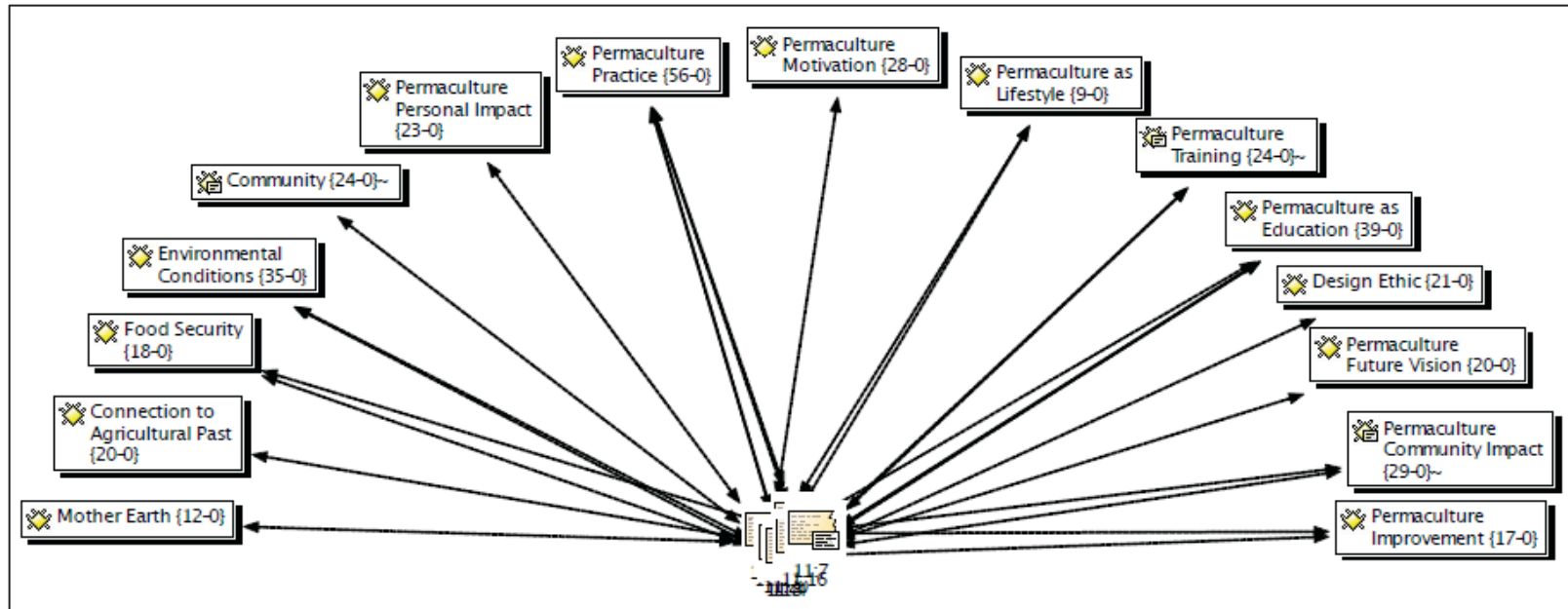


Figure 29. Code map of Regino's interview

## Appendix 2

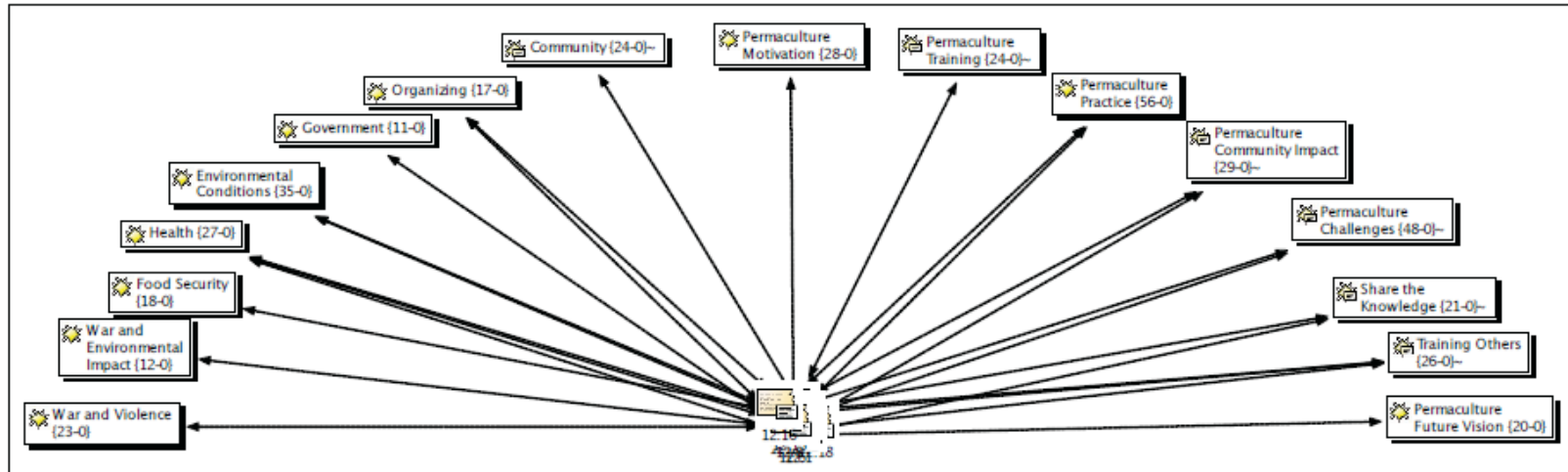


Figure 30. Code map of Maria's interview

### Appendix 3

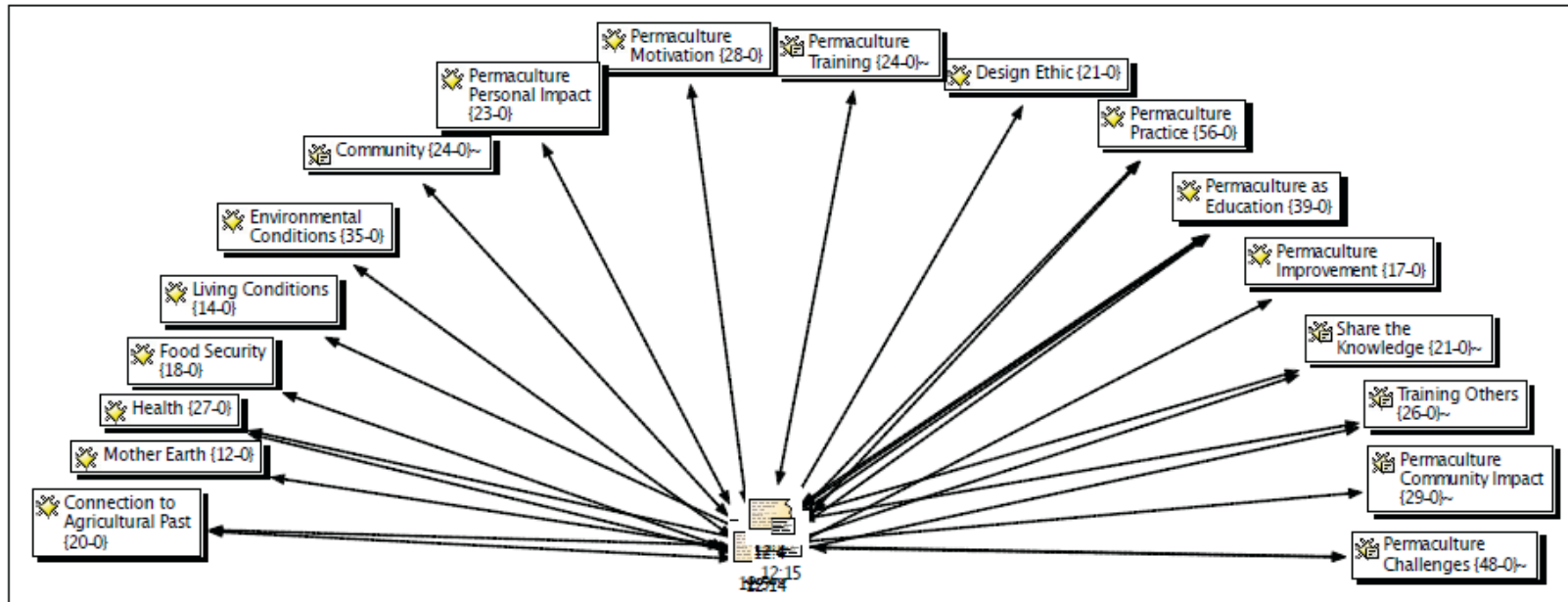


Figure 31. Code map of Thelma's interview



## Appendix 4

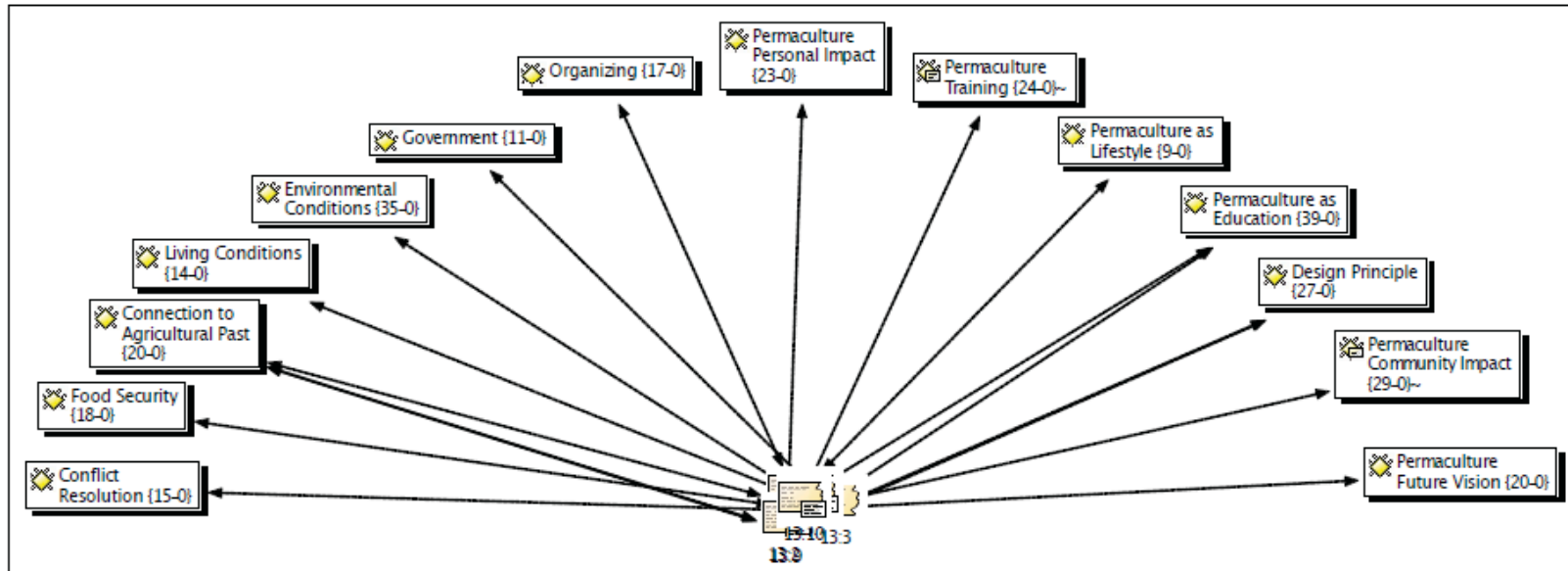
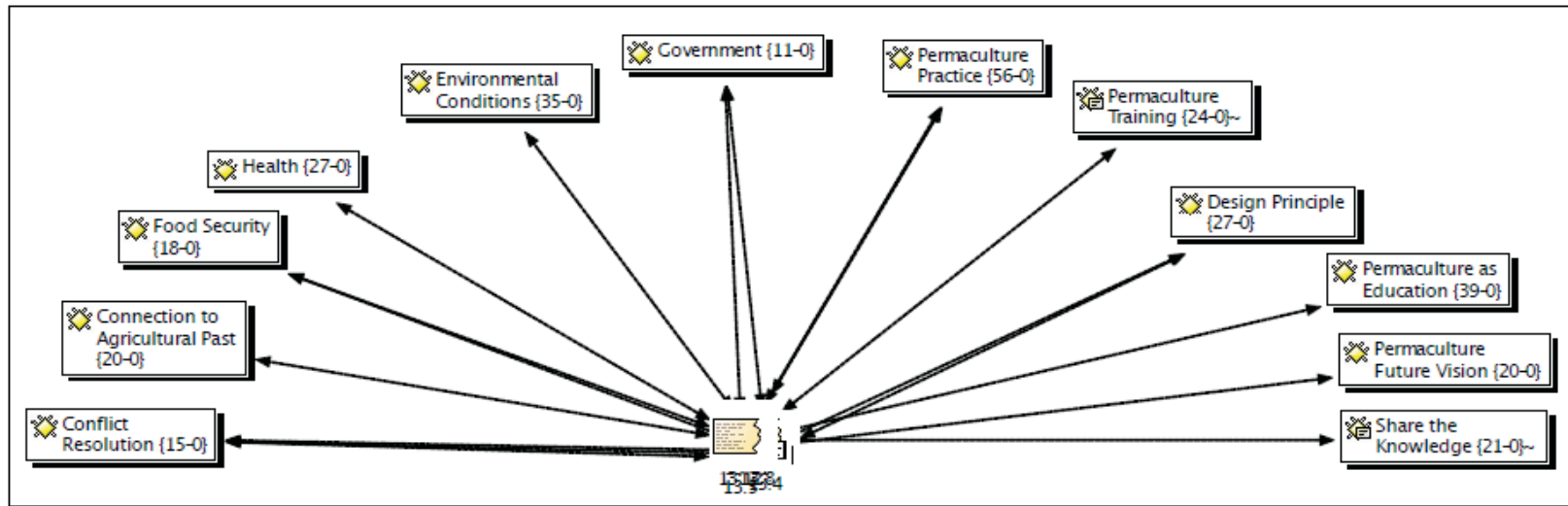


Figure 32. Code map of Miguel's interview (MAOES)

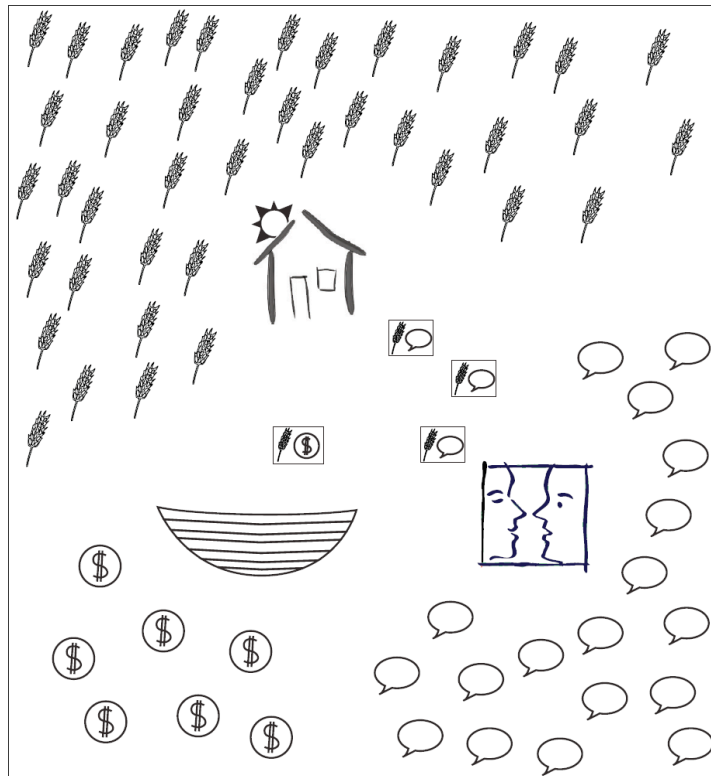
## Appendix 5



240

Figure 33. Code map of Ricardo's interview

## Appendix 6



**Figure 34.** Interview data coded according to United Nations Environmental peacebuilding definition.

Sustainable livelihood development is represented by the house, and each coded quote is represented by the wheat shaft. Contribution to dialog and cooperation is represented by faces in conversation, and the coded quotes are represented by the quote bubble. Economic recovery and development is represented by the basket, and the coded quotes are represented by coins. It is important to note that the economic quotes that appear represent quotes regarding local economic development. Quotes represented by two icons represent a single quote where two UNEP concepts were discussed within the same coding unit.

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## CURRICULUM VITAE

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